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Dear Esteemed Readers, Authors, and Colleagues,

I hope this letter finds you in good health and high spirits. It is my distinct pleasure to address you as the Editor-in-Chief of Integrative Omics and Applied Biotechnology (IIOAB) Journal, a multidisciplinary scientific journal that has always placed a profound emphasis on nurturing the involvement of young scientists and championing the significance of an interdisciplinary approach.

At Integrative Omics and Applied Biotechnology (IIOAB) Journal, we firmly believe in the transformative power of science and innovation, and we recognize that it is the vigor and enthusiasm of young minds that often drive the most groundbreaking discoveries. We actively encourage students, early-career researchers, and scientists to submit their work and engage in meaningful discourse within the pages of our journal. We take pride in providing a platform for these emerging researchers to share their novel ideas and findings with the broader scientific community.

In today's rapidly evolving scientific landscape, it is increasingly evident that the challenges we face require a collaborative and interdisciplinary approach. The most complex problems demand a diverse set of perspectives and expertise. Integrative Omics and Applied Biotechnology (IIOAB) Journal has consistently promoted and celebrated this multidisciplinary ethos. We believe that by crossing traditional disciplinary boundaries, we can unlock new avenues for discovery, innovation, and progress. This philosophy has been at the heart of our journal's mission, and we remain dedicated to publishing research that exemplifies the power of interdisciplinary collaboration.

Our journal continues to serve as a hub for knowledge exchange, providing a platform for researchers from various fields to come together and share their insights, experiences, and research outcomes. The collaborative spirit within our community is truly inspiring, and I am immensely proud of the role that IIOAB journal plays in fostering such partnerships.

As we move forward, I encourage each and every one of you to continue supporting our mission. Whether you are a seasoned researcher, a young scientist embarking on your career, or a reader with a thirst for knowledge, your involvement in our journal is invaluable. By working together and embracing interdisciplinary perspectives, we can address the most pressing challenges facing humanity, from climate change and public health to technological advancements and social issues.

I would like to extend my gratitude to our authors, reviewers, editorial board members, and readers for their unwavering support. Your dedication is what makes IIOAB Journal the thriving scientific community it is today. Together, we will continue to explore the frontiers of knowledge and pioneer new approaches to solving the world's most complex problems.

Thank you for being a part of our journey, and for your commitment to advancing science through the pages of IIOAB Journal.



Yours sincerely,

Vasco Azevedo

Vasco Azevedo, Editor-in-Chief
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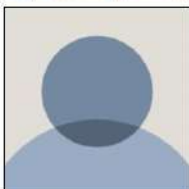
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ARTICLE

THE IMPACT OF COMMITMENT ON CUSTOMERS' SATISFACTION WITH REGARD TO THE MEDIATING ROLE OF EMPLOYEES AND CUSTOMERS' FRIENDLY RELATIONSHIP (CUSTOMERS OF BANK MELLI IN GILAN PROVINCE)

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ABSTRACT

The most useful and the most appropriate strategy for the banks is customer orientation. Customer's satisfaction is regarded as one of the most important factors in determining organizations' success. The goal of this research is to investigate the impact of commitment dimensions on customers' satisfaction. It also investigates the impact of friendly relationship as a mediating variable between each of the commitment dimensions and customers' satisfaction. This research is applied in respect of goal, and it is descriptive type in respect of data analysis method, and exploits questionnaire tool. In this research the questionnaire was distributed among the customers of Bank Melli in Gilan province and its results were analyzed. The research results showed that the relationship between commitment dimensions (affective commitment, continuous commitment, normative commitment) and friendly relationship has positive impact on the customers' satisfaction, and the research results also indicated that the friendly relationship mediates the relationship between customers' commitment dimensions and their satisfaction of bank.

INTRODUCTION

KEY WORDS

Customers' Satisfaction,
Friendly Relationship,
Affective Commitment,
Continuous
Commitment, Normative
Commitment

A customer's feeling or attitude towards a product or service after using it, in terms of whether the product or service fulfills his/ her requirements and expectations [1]. Banking in Iran during recent decade has faced with change and developments in deregulation arena and new technologies in services, and determining the goals of growth by the banks that are often public leads this system towards competitiveness. By enhancing the competition area in the banking system of Iran, the banks should continuously monitor their performance and type of services. In this regard, the banks can ensure their success in competing with other competitors to a great extent with regard to their competitive advantages and strengthening them. A lot of endeavor and effort that nowadays is done to promote performance management tools and the expansion of customer orientation attitude by the researchers, experts, and managers of business organizations indicate that currently customer's satisfaction is one of the most important factors in determining organizations' success [2].

This point can never be ignored that the main stimulus for business and service organizations such as banks that are seeking major improvements in their progress path is actually the customers of that organization. In other word, no business is able to continue survival and obtain success without customer. Thus, it is very vital for every business institute to have a framework for understanding, analysis, and evaluation of the status of its customers' satisfaction. There is no doubt that in the mass production and endless competition arena, those organizations achieve success that increases their customers' satisfaction ratio up to the level of complete loyalty [3].

Customer's satisfaction refers to the ratio that customer is satisfied with and happy of his/her online purchase experience [4]. The companies are eagerly seeking value in direct evaluation and tracking customers' satisfaction as an important strategic success indicator [5]. Customer's satisfaction is considered as an important factor in the success of every organization and its continuation at the market position. Generally, it is argued that if the customers are satisfied with the specific products and services they are using, hence it is likely that they repeat repurchasing and they might tend to develop the path [6]. Satisfaction means continuous improvement. Continuous improvement is the only way that keeps the customer satisfied and loyal [7].

The most useful and the most appropriate strategy for the banks is customer orientation. Actually this sentence can be expressed much stronger, and that is to say the basis and foundation of banking system is customer. In today's marketing the cost of losing customer is equal to losing the benefits related to the services which that customer need in his/her lifetime. A research done by Strategic Planning Institute in

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Washington DC showed that the investment return of 20 percent of banks that emphasize on their customers' requirement have almost been twice of those banks that have not considered this point. Customer's satisfaction provides countless advantages for the company; in fact higher levels of customer's satisfaction lead to more loyalty. The satisfied customers will more likely talk about their experiences to others as well. This point has had special importance particularly in eastern cultures that the social life has been formed in a way that social communication with other community members is more. Customer's satisfaction is regarded as a key factor in forming customers' immediate purchasing tendency. The importance of this point is to the extent that customer's satisfaction is the most important factor in the models of quality such as European Foundation for Quality Management (EFQM) [8].

One of the most important structures related to the customer's satisfaction is commitment (Ouyang, 2010); a structure that can be used by various methods [9]. For instance Wu in 2011 has emphasized on the role of customer's commitment in the relationship of customer's satisfaction and loyalty [10]. Moreover, Aurier and N'Goala in 2010 have performed research about the role of commitment in the relationship between customers' satisfaction and customers' behavioral intention [10]. The researchers have offered various definitions about commitment; among them a definition has stated the commitment as continuous relationship and maintaining relationship [11]. On the other hand Meyer and Allen in 1997 have divided commitment into three types of affective commitment, continuous commitment, and normative commitment [11]. Continuous commitment is described as rationale and economic motivations (such as: lack of selection, costs change, personal interest, product interest, and etc.) [12]. Affective commitment is an emotional or mental mode in relationship with an organization or company [13]. Normative commitments are based on ethical obligations and duty [13].

Another concept discussed in customers' satisfaction is the concept of friendly relationship. According to the previous studies[14,15], the employees' and customers friendly relationship has positive impact on the customers' general satisfaction. The friendly relationship or rapport has been stated as an important structure in many aspects of life [10]. In some studies such as Delcourt et al. [16] the friendly relationship has been mentioned as a mediator between satisfaction and loyalty. The friendly relationship in service interactions impacts on the customers' understanding and attitude [16].

The importance and necessity of research is that the organization of Bank Melli has continuously been seeking its customers' satisfaction as much as possible, and hence believes that creating a friendly relationship to increase customers' commitment is essential. Currently it seems that the interaction and rapport with customers is among the basic and essential issues of banking industry, and in today's competitive space considering it seems to be essential. With regard to the stated literature, we are seeking the answer to the question that how much is the ratio of commitment impact on the satisfaction of Bank Melli customers with regard to the mediating role of employees and customers' friendly relationship?

MATERIALS AND METHODS

Model and Hypotheses

Regarding the stated literature and research variables, the research conceptual model driven from the conceptual model of Fatima et al. [2015] has been presented in [Fig. 1]

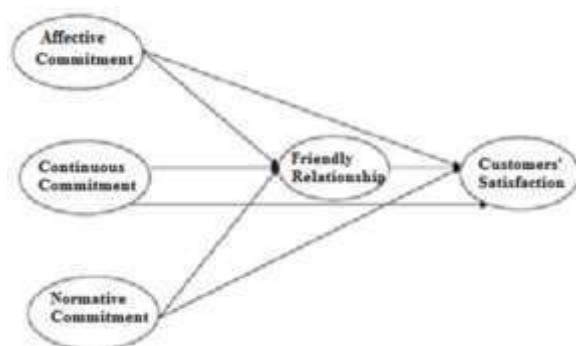


Fig. 1: Research Conceptual Model Driven from Conceptual Model of Fatima et al. [2015]

Research Hypotheses

The hypotheses of present research are:

1. Customers' affective commitment has positive impact on the friendly relationship.
2. Customers' affective commitment has positive impact on the customers' satisfaction.
3. Customers' continuous commitment has positive impact on the friendly relationship.
4. Customers' continuous commitment has positive impact on the customers' satisfaction.
5. Customers' normative commitment has positive impact on the friendly relationship.
6. Customers' normative commitment has positive impact on the customers' satisfaction.
7. Friendly relationship has positive impact on the customers' satisfaction.
8. Friendly relationship mediates the relationship between the customers' affective commitment and their satisfaction of bank.
9. Friendly relationship mediates the relationship between the customers' continuous commitment and their satisfaction of bank.
10. Friendly relationship mediates the relationship between the customers' normative commitment and their satisfaction of bank.

Sample Size and Data Collection

The statistical population of this research is composed of the customers of Bank Melli in Gilan province, the number of which is 2 million people. The sample size was determined by using Cochran formula and 419 customers were selected as minimum sample size. The sampling method was also simple random. For more confidence, 450 questionnaires were distributed, that 428 returned questionnaires were analyzed. In this research in order to collect the required data the field method has been used. Data collection tool was questionnaire including a questionnaire that contained 14 items in the (affective, continuous, and normative) commitments format including 7 items, customers' satisfaction including 5 items, and friendly relationship including 2 items driven from the article of Fatima (2015) that the respondents will answer about the impact ratio of commitment on satisfaction. The basis of responding is Likert's five options scale.

Validity and Reliability

To assess the questionnaire validity, the content analysis method and also confirmatory factor analysis have been used. In this respect, for validity of research measurement tool, the initial questionnaire was provided for the experts of the field, and by using the mean of their viewpoints and performing modifications, the final questionnaire was designed. In the confirmatory factor analysis section, the validity of all items was also confirmed. In this research in order to determine the reliability of questionnaire with emphasis on internal contingency of questions, the Cronbach's alpha coefficient method has been used (Table 1), that the value higher than 0.8 is regarded completely appropriate, although many researches know the alpha higher than 0.7 acceptable and reliable.

Table 1: Reliability of Research Variables

Variable	Questions	Initial Alpha Coefficient
Affective Commitment	1-3	0.88
Continuous Commitment	4-5	0.78
Normative Commitment	6-7	0.89
Friendly Relationship	13-14	0.99
Customers' Satisfaction	8-12	0.80
All Items	1-14	0.84

RESULTS AND FINDINGS

In the group under investigation, 55.1percent of participants (236 people) were male, and 44.9 percent of participants (199 people) were female. In the group under investigation, 27.3 percent of participants had

Diploma, 34.8 percent of participants had Associate Degree, 33.4 percent of participants had Bachelor, and 4.4 percent of participants had Master degree.

Since one of the assumptions of using causal relationships is the lack of multiple linear relationships between variables, the correlation coefficients between variables used in the research, before doing casual analysis, was calculated to investigate the lack of multiple common linear relationships between variables [Table 2]. All correlation values had value less than 0.8.; thus, the existence of multiple common linear relationships between variables was rejected.

Table 2: Correlation Matrix of Main Variables Under Study

Variable	Affective Commitment	Continuous Commitment	Normative Commitment	Friendly Relationship	Customers' Satisfaction
Affective Commitment	1				
Continuous Commitment	0.230**	1			
Normative Commitment	0.487**	0.103**	1		
Friendly Relationship	0.370**	0.237**	0.366**	1	
Customers' Satisfaction	0.766**	0.642**	0.420**	0.740**	1

All correlations are significant at 0.05 level

The structural equations modeling has been used for testing hypotheses. For testing the significance of hypotheses two indicators of partial critical value and significance level have been used. The critical value is the value obtained from dividing the estimate of regression weight to standard error. Based on the significance level 0.01, the critical value should be more than 1.96, and the related parameter in the model with less than this value is not regarded as important. The values smaller than 0.01 for significance level value also indicate significant difference calculated for regression weights with zero value at 0.95 confidence level [Table 3].

Table 3: Regression Coefficients of Research Hypotheses

Hypothesis Number	Hypothesis			Regression Coefficients			Critical Value	P	Result
				Direct	Indirect	Total Impact			
1	Affective Commitment	→	Friendly Relationship	0.79	-	0.79	-	0.000	Confirmed
2	Affective Commitment	→	Customers' Satisfaction	0.68	-	0.68	-	0.000	Confirmed
3	Continuous Commitment	→	Friendly Relationship	0.55	-	0.55	-	0.000	Confirmed
4	Continuous Commitment	→	Customers' Satisfaction	0.75	-	0.75	-	0.000	Confirmed
5	Normative Commitment	→	Friendly Relationship	0.88	-	0.88	-	0.000	Confirmed
6	Normative Commitment	→	Customers' Satisfaction	0.60	-	0.60	-	0.000	Confirmed
7	Friendly Relationship	→	Customers' Satisfaction	0.65	-	0.65	-	0.000	Confirmed
8	Affective Commitment	Friendly Relationship	Customers' Satisfaction	0.88	-	0.88	-	0.000	Confirmed
9	Continuous Commitment	Friendly Relationship	Customers' Satisfaction	0.60	-	0.60	-	0.000	Confirmed

10	Normative Commitment	Friendly Relationship	Customers' Satisfaction	0.65	-	0.65	-	0.000	Confirmed
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The final structural equations modeling of research has also been shown in [Fig. 3].

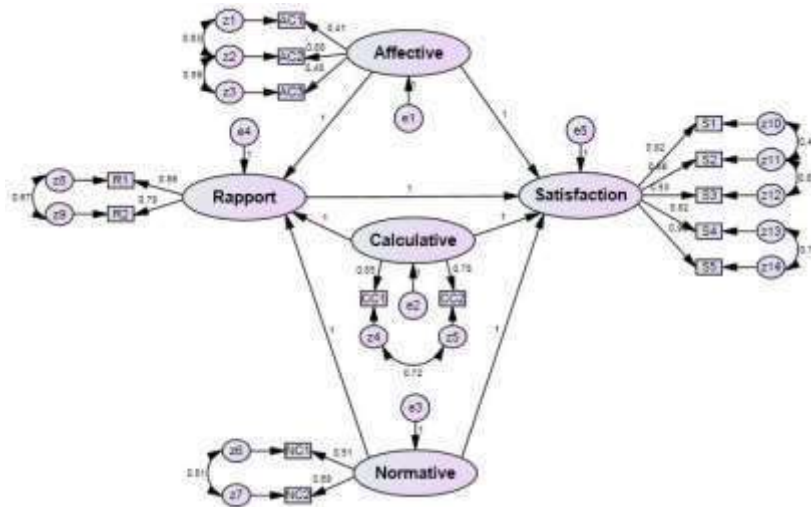


Fig. 2: Final Structural Equations

CONCLUSION

In today's competitive world attracting customers and maintaining customer has high importance for the companies and organizations. For this reason, various models have been designed for assessing customers' satisfaction in the world, but since every industry has its specific requirements, the models of assessing customers' satisfaction needs to be localized according to the need of every country and each industry. According to the customer orientation principle an organization that wants to be excellent, should have created stable value for the customer, acts beyond his/her expectations, and know that the customers are final judges of the quality of products and services of the organization. The excellent organizations by focusing on the customers' expectations and maintaining them, maximize indicators such as the market share, trust and loyalty of customers. These organizations respond customers' expectations and for this purpose investigate the ratio of their customers' satisfaction and try to improve it. The customer orientation organizations plan their activities according to the customers' expectations and seek satisfying the customers' requirements and wishes. These organizations design and offer their products and services with the aim of satisfying the customers' requirements and demands.

Future researchers are suggested to investigate other important and vital indicators of customers' satisfaction and design a more complete research framework for every organization. The future researchers are also suggested to investigate the demographic variables such as gender, age, work experience, and educations ratio and see to what extent these variables adjust this relationship in the target society.

CONFLICT OF INTEREST

There is no conflict of interest

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REFERENCE

- [1] Salehi SM, NikokarGh, Mohammadi A, TaghiNatajGh. [2011] Designing Performance Evaluation Model of the Branches of Banks and Financial and Credit Institutions. *Business Management*. 3(7): 127-142.
- [2] Navaratnaseelan JJ, Elangkumaran P. [2014]. Impact of Service Quality on Customer Satisfaction: A Study on Customers of Commercial Bank of Ceylon PLC Trincomalee District. *Proceedings of the 3rd International Conference on Management and Economics*. 26-27.
- [3] KunduKundu S, Datta SK [2015] Impact of trust on the relationship of e-service quality and customer satisfaction. *EuroMedJournal of Business*. 10(1): 21 – 46.
- [4] Santhiyavalli G. [2011]. Customer's Perception of Service Quality of State Bank of India, A Factor Analysis. *International Journal of Management & Business Studies*. 1(3): 78-84.
- [5] Abdullah A, Kassim N. [2009] Measuring Perceived Service Quality in Qatari Islamic Banks. *Journal of International Business and Entrepreneurship Development*. 1(2): 90-106.
- [6] Goetsch D, Davis S. [2013] Customer Satisfaction. *Quality Management for Organizational Excellence*. Seventh Edition. Pearson Education, Inc., Upper Saddle River, New Jersey.
- [7] Sedghi A, Ghazizadeh M, Maghbolli MM. [2012] Identifying the Relationship of Service Quality and Company Image with Customers' Satisfaction and Loyalty, Iran Marketing Bank Articles. 1-46.
- [8] Fullerton G. [2005] How commitment both enables and undermines marketing relationships. *European Journal of Marketing*. 39(11/12): 1372-1388.
- [9] Fatima JK, AbdurRazaque M, MascioDiR. [2015] Modelling roles of commitment on rapport and satisfaction. *International Journal of Bank Marketing*. 33(3): 261 – 275.
- [10] Morgan RM, Hunt SD. [1994] The commitment – trust theory of relationship marketing. *Journal of Marketing*. 58(3): 20-38.
- [11] Gustafsson A, Johnson MD, Roos I. [2005] The effects of customer satisfaction, relationship commitment dimensions, and triggers on customer retention. *Journal of Marketing*. 69(4): 210-218.
- [12] Johnson MS, Sivadas E, Garbarino E. [2008] Customer satisfaction, perceived risk and affective commitment: an investigation of directions of influence. *Journal of Services Marketing*. 22(5): 353-362.
- [13] Gremler DD, Gwinner KP. [2008] Rapport-building behaviors used by retail employees. *Journal of Retailing*. 84(3): 308-324.
- [14] Meyer JP, Allen NJ. [1997] *Commitment in the Workplace: Theory, Research, and Application*, Sage, Thousand Oaks, CA.
- [15] Delcourt C, Gremler DD, Riel ACRV, Birgelen MV. [2013] Effects of perceived employee emotional competence on customer satisfaction and loyalty, the mediating role of rapport. *Journal of Service*
- [16] Lee FH & Wu WY. [2011] Moderating effects of technology acceptance perspectives on e-Service quality formation: Evidence from airline websites in Taiwan. *Expert Systems with Applications*. 38: 7766-7773.
- [17] Macintosh G. [2009] The role of rapport in professional services: antecedents and outcomes. *Journal of Services Marketing*. 23(1): 71-79.
- [18] Ouyang Y. [2010] A relationship between the financial consultants' service quality and customer trust after financial tsunami. *International Research Journal of Finance and Economics*. 36(2): 75-86.

ARTICLE

APPLYING URBAN VILLAGE APPROACH, APPROPRIATE SOLUTION AT REALIZATION OF SUSTAINABLE HUMAN SETTLEMENTS (CASE STUDY: HAMEDAN MORADBEIG VALLEY)

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ABSTRACT

The idea of "urban village" as a strategy for realization of stability in settlements with different conditions and different social and economic motives, as a solution for urban and rural sustainable development is used, and its success at many samples shows the universality of it. This idea was raised as a strategy for realization of sustainable development in the UK. It aims to create an environment with diverse uses, self-sufficient, with priority for public transport and pedestrian and an attractive communal spaces to encourage the development of the local community and public participation. At this study it was examined and aimed at on the urban villages design principles through library and field studies. In the formulation of experiences related to this idea, after introducing the project and its history, instructions and key strategies used in each one, especially of aspects of architecture and urban design, accesses and paths, the proposed uses, the type of buildings as well as strategies used to promote sustainability and reduce energy consumption, has been proposed. Creation of sustainable human settlements using urban village approach, will be the solution to existing problems and to control the development of organic textures. This study aims , with using of theoretical principles, the determination of concept of urban village, and examination of international successful experiences related to the topic, according to the local conditions of the country for a case study (Moradbeig Valley settlements Hamadan), to offer the proposals for achieving the development control strategies and inconsistent constructions in rural-urban settlements. Implementation of the principles of this model will be extended according to the circumstances of each region and after adapting to the needs of local residents.

INTRODUCTION

KEY WORDS:

Urban village,
sustainable
development,
sustainable settlements,
settlement Moradbyg
Valley.

The issue of sustainability and sustainable locations' planning and design at recent years, allocated a large part of literature architecture and urbanism to itself. At theoretical areas many doctrines and ideas are provided by scientific communities, institutions and organizations [1]. Including: the notion of a compact city, smart city, green city, the traditional new city, Eco City and so on. Many scientists and analysts believe that sustainability requires a change in thinking or a fundamental change at our way of thinking and acting, but few went even further and express the characteristics of such a development. In fact, despite that in the theoretical and philosophical framework, the sustainability issues were studied several times, how to achieve it, and strategies to promote stability in settlements, were not clear and tangible. Between the 70s to 90s, scientific views, somewhat were in doubt and questioned, and thus movements such as New Urbanism movement in America, and urban village in England, were formed. This approach is based on pragmatism and relies on experience and deals with problem-solving process without directly addressing the broad and complex theoretical principles theories. Limiting up to suitable size, high density, and diversity and mixing land uses, employment possibility and housing for different groups, relative economic independence, priority presence of pedestrians and reducing dependence on cars, make up the main elements of urban village.

MATERIALS AND METHODS

The aim of this study is assessing urban village approach in achieving sustainable human settlements. The research method is analytical-navigational, that initially deals with investigating and extracting design principles about urban villages through library studies. In relation to identification of case of study, by doing field studies and presence of in space we attempt to assess the status quo.

Research background

Urban villages with an area of one hectare to 300 hectares have been identified. Living population in urban villages is variable from 160 people to 15 thousand people. Urban villages in rural areas, the suburbs and urban centers are feasible to create [2]. Following successful foreign examples are discussed and details of each of these urban villages will be provided in the form of images and tables.

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Bilsotun urban village

Bilston is one of the cities in the region of West Midlands in England, that is located in a distance of four kilometers in southeast of the city of Wolver Hampton. Strategic plan and position of BilstonUrban Village is shown in [Fig. 1].

In Bilston Urban Village project what is most considered, is considering the environmental context of the plot, natural environment factors (water channels and land topography). The plan emphasis is on riding and pedestrian traffic and attention to the strategy of traffic calming, especially in residential areas. Project proposals are ,in this field, by setting a package of measures, to limit the speed of vehicles , and this is raised by changing the flooring and defining some side streets to the main streets, only with priority given to pedestrian movement.

Considering texture identity, collective open spaces and incorporation of land use and types of buildings, has been considered. So that plan has caused readability of area texture and has emphasized on strong identity of region by defining central squares and strengthening active spaces alternative to disabled spaces. Infrastructure and infrastructure facilities are of the points that have been addressed and the project on a large scale (whole area) is discussed in detail [3].



Fig.1: Geographical location and plans designed Bilsotun Urban Village [3]

Table 1: Experience Bilsotun urban village

Regional position	One of the cities in southeast England West Midlands region Wolver Hampton
Design time	years 2004 s
The designer or company employer	Wolver Hampton union council in the city
The executive plan	has been done
The main arguments and the key concepts plan	According to the plan, ecological context, natural environment factors (water channels and topography), especially in residential areas, traffic relaxation strategies, according to tissue identity, open spaces and public infrastructure, land use mix and types of buildings

(Source: [5])

Kelvin Grove Urban Village

Kelvin Grove Urban Village in Australia is a collection with all residential, educational, business and leisure services, with area of 16 hectares, that its project started in 2002, and are elapsing its complementary stages of development in 2010. In this urban village, emphasis is on respect for the environment and attention to security and convenience of residents, capability of walking and pedestrians. Of the points of emphasis is considering the dimensions of landscape, visual attractions. Buildings, both functionally and in terms of color facade materials, both technically and in terms of density vary greatly. So that also covered various social classes and provide their needs. Mixed land use, are other remarkable aspects in this project that created the lively and identified environment [4].



Fig.2:Kelvin Grove Urban Village geographical location and plan designed[3]

Table 2: Kelvin Grove Urban Village experience

Regional position	In Queen Island in northern Australia
Design time	years 2002 s
The designer or company employer	UDIA Institute of urban development and protection of the environment , EPA
The executive plan	Further development is done in stages
The main arguments and the key concepts plan	Respect for the environment, pay attention to security, convenience, convenient access to facilities and services and walkability, according to the dimensions of landscape and visual attraction, a variety of buildings andmixed land use, environment and identity lively

(Source: [5])

Derived criteria from two experiences above (Bilston and Kelvin Grove) that are similar to a large extent are classified as follows:

- 1-to pay attention to environmental factors and respect for the environment;
- 2-The principle of reducing travel by car and convenient access to facilities, services and features walkways;
- 3- To create an lively environment and with identity through strengthening active spaces and open spaces considering the dimensions of landscape and visual attractions;
- 4- To mix land use and variety of buildings (Bahrain and Haji Bandeh, 2011: p. 59).

Greenwich Millennium Village city

Urban area Greenwich Peninsula, with an area 325 acres, is located in the heart of London in Britain, and is adjacent to the River Thames. Greenwich Millennium Village city strategic plan, including the public transport station, elementary school, Footpaths along the river, view of the buildings constructed adjacent the river and central village squares with a higher density than vertical mixed land uses, is designed, and now their construction was completed. Placement of village near the river has raised importance of environmental aspects of the plan [3].



Fig. 3: Urban design plan of the Greenwich Millennium Village[3]

Table 3: Urban Greenwich Millennium Village experience

Regional position	Greenwich peninsula in the urban area in the heart of London, in Britain
Design time	years 2000 s
The designer or company employer	Ralph Erskine partners and companies and plants and revive England , with Taylor Woodrow
The executive plan	performed and its development has been completed
The main arguments and the key concepts plan	emphasis on the local public transport and promote the building and construction techniques and consistent with the environment, according to provide all facilities and services , including restaurants , cafes, schools, housing , health services and infrastructure , equipment and serious attention to the development of common residential areas and design and compatible with the nature of spaces

(Source [3])
Lakel and Village city

The village Lakeland urban area located in the United States and has an area of 1200 acres, the potential of natural resources, forest vegetation is dense. Lake land Green village city is of the type of Green Field's project. A project that is located in the largest green area. Development of mixed land uses, pedestrian-priority community and a lot of potential for walking and needs of pedestrians that more than half of it is dedicated to public green areas , and high percentage of protected green lands make residents able to experience both urban life and rural life with walkable distances from their homes . It should be noted that only some parts of the plan have been implemented and project's complementary development in the region continues. One of the distinctive features of this urban village is its development in harmony with the natural context [3].



Fig.4: Designed Plan of the village of urban Lakeland and urban spaces that [3]

Table 4: the experience of urban village Lakeland

Regional position	In the region of Lake land is located in Tennessee, near Memphis in the United States.
Design time	years 2004 s
The designer or company employer	Governmental institution in Tennessee
The executive plan	in progress
The main arguments and the key concepts plan	emphasis on land use complex , construction, consistent with the environment, according to the pedestrian priority and the ability to walk , stressing the public spaces, vivacious, according to walk away from residential houses to service, benefiting from the site of the component and natural forests of the region and preserve natural environment , according to the application of new energy

(Source: [3])

Classification based on the extraction methods used in the above experimental samples (urban village Lakeland and Greenwich Millennium), is as follows:

1. Utilization of natural components of the site, and pay attention to environmental protection through the construction compatible with the natural environment,
2. Emphasis on local public transport and its promotion, considering the priority of pedestrians and walking distance to service residential home,
3. Emphasis on lively public spaces and in harmony with nature,
4. Mixing land use and considering all the services and facilities,
5. Regarding the use of renewable energies [3].

Research theoretical principles

principles and concepts of urban village

Urban village concept, in fact came into existence in rejecting one-dimensional modernist urban planning (innovative). Because in innovative urban planning, work and leisure and living spaces have been separated, these spaces were governed by cold and lifeless environment, and excessive use of the car has reduced human relationships and causes environmental pollution as well, and consequently leads to reduction of stability in settlements [3]. The first spark of this idea was struck by the Prince of Wales (Krier), and by designers, planners, architects, builders and developers, it was flaming. While the Prince of Wales (Prince England) described urban village as the place that has a human scale, intimacy, identity and vitality, in this regard, he gathered a group of architects, designers and planners together and a group known as the "urban village" is formed. The group start travelling in looking for places that are efficient, attractive and are responsive and finally by analyzing the places that they had found, they reached to the urban village model. The purpose of this group from their studies was to acquire the principles governing the human environment and to offer suggestions and solutions for how to use these principles in new development [6]. The findings of the members of the urban village group was released in 1992 in "urban village report " and in 1995 another report entitled "The Economics of urban villages" concept of urban village success and viability was demonstrated [7] and also second Edition of "urban village report " was published in 1997 [8]. As urban compact form, urban villages use lands more effectively and efficiently and reduce pressures for development on agricultural and open spaces. They also improve regional air quality by reducing car journeys, and they use resources such as land and energy more efficiently and more effectively than where these resources are scattered. Successful urban villages are able to attract people to themselves and provide social, recreational and cultural places and provide services for neighbors, regions, local residents and tourists. They can arise in urban and rural areas and can have high or low population [9].

Characteristics of urban village

In a report entitled urban village report in the UK that was released in 1992, the main pillars of the movement were announced as follows: development of adequate space and mass, walkability and attractive pedestrian environment, proper mixing land uses and opportunities employment, diverse and sustainable architecture, blending residential and employment uses, the possibility of providing basic necessities, Health and education, relative independency [10]. The following describes the characteristics of urban villages:

The environmental characteristics of urban village

Creating a healthy microclimate is protected in urban villages, by decreasing long journeys and reducing need for private vehicles. Walking and bicycle use has priority over private vehicle, and thus less environmental pollution produced. New technologies for constructing and using of renewable and clean energies are used as far as possible. The integration of manmade environment with natural environment can be seen in most urban village spaces. Minimal interference takes place in the natural environment in an urban village. Presence of sufficient Green and open spaces has significant effect on micro climate and causes air pollution decreasing. Reducing fuel consumption as well as waste recycling and reusing are of those significant and important issues in an urban village [11]. In general it can be said that the optimal balance between nature and resources exists.

Social features urban village

In order that stability in a village or any other settlement can the value and credibility, it should cover social aspects and in parallel with regarding the environmental issues, considering social and human issues. Major features of the social urban village are as follows:

- 1- A population of about 3 to 5 thousand for an urban village, is recommended (Neal, 2003: p. 91).
- 2- Creation and supporting active human environment and public spaces alive, is considered [3].
- 3- Social interactions with many social ties of inhabitants are of the characteristics of an urban village.
- 4- An urban village, in the same relation to the surrounding areas, is a relatively closed society with its own characteristics and identity [12].
- 5- There is the sense of belonging to the living place in all the inhabitants.
- 6- Local residents participate in various activities and processes, can be seen. High quality of life and finally social sustainability are the main goal of an urban village [13].

Economic characteristics of urban village

Urban villages are places that are relatively self-supporting [10], which means that the majority of residents are employed in a near distance to their location and to provide most of their daily and weekly needs, they didn't need to go long trips to rural and other areas, of course, it is necessary to note that this is a relative self-sufficiency and looking at a urban village or a neighborhood as a completely standalone unit cannot be reasonable [3].

Jane Jacobs considers the lack of full social and economic self-reliance natural and necessary, and emphasize on considering the urban neighborhoods or villages as a whole [14]. Residents engaged in a variety of economic activities including farming, small scale industry, tourism and so on and there are different types of land ownership [10]. Necessary infrastructures are provided for different employment fields including agriculture, handicrafts, livestock, etc. New technologies for using and making clean and renewable energy are used in buildings as much as possible [3].

Physical features urban village

Dimensions and sizes

Dimensions of an urban village is that small that neighborhood concept will be felt and causes reinforcing the sense of place and increasing in social interactions and face to face interactions and at the same time it is that big that can have capability to provide a wide range of facilities in a reasonable way. The notion of a group urban village poses an area of about 40 hectares that accommodates a population of about three to five thousand people in itself [15].

Network communication

Among the noteworthy strategies in designing communication network of an urban village, the following points may be noted: the priority for walking routes and special cycling route should be considered. Pedestrian capability is the basic criterion of action in reaching to daily and sometimes weekly uses. Therefore, the maximum available radius considered to be 600 meters, to encourage walking and minimize use the car. Walking paths and even the most local riding routes equipped with Preparations such as putting absorbing spaces and pause places with suitable urban furniture, and provide an opportunity for social communicating and valuing the environment, and in fact multi-dimensional role of streets and roads in order not to sacrifice the needs of car performance and even human [10]. Network riding paths should be considered in a way that communication of urban village with the surrounding villages and other surrounding neighborhoods is possible and the routes that are considered in the design of urban villages, if possible, be based on the existing ones. Existing Cavalry routes should control the speed of riding with provisions such as change in width, creating bumps and so on in urban village.

Efficient public transportation system should be considered for the collection of urban villages. Variations should be seen in the different sequence in existing paths in an urban village [3].

Uses and activities

Mixed use and variety of activities to reduce the need for long travel as well as vitality of urban settlements is of urban village's characteristics [16]. There are active uses at different hours of the 24/7 in many places of urban village. As Jacobs writes: "Whatever a use is, it is solely inefficient like creating a urban diversity, if this use combined with other use which causes movement of the people to the street at the same time, it wouldn't work, but when a use combined effectively by other use which draws people to the streets at different times it would have a stimulating effect[14]. The mass uses and public spaces that encourage people to do social activity and campaigns in public open spaces are very important in an urban village, campaigns, have not crucial aspects, and they have been done in circumstances that desired background is provided and social activity are subject to the presence of other people in the space, and out of the collective shape they are not possible[17].

Visibility and perspectives

Diverse and successive views in trails attract and encourage pedestrians to walk. Existence of green and open spaces causes vitality of space and integration of natural and artificial environment and it causes the spatial variation. Existence of Semi-open and open spaces create a spatial contrast and aesthetic principles are considered in designing details of space such as furniture, flooring and other elements [3].

Principles of sustainable human settlements based on the concept of urban village

Based on what was said, the principles governing the human environment to some extent sustainable that have been named as urban villages are as follows: A location contains human scale, intimacy, identity and lush: Social strong links and creating many social interaction of residents, i.e. participation of inhabitants in various local activities and processes, and creating and supporting active human environment and live public spaces are of the characteristics of an urban village that while connected with surrounding areas, is a society relatively closed with its own characteristics and identity that there is a sense of belonging to place in all the tenants living there. It has compact urban form with the appropriate space development and sufficient mass. In this way, by efficient use of land and energy resources, compared to those places where these resources are scattered, reduce development pressures on agricultural land and open spaces more effectively. Furthermore, it creates various and more stable architecture with different types of land ownership. New technologies for construction and use of clean and renewable energy is used as far as possible in buildings. It is a walkability-focused and attractive pedestrian environment: Therefore, reducing car trips improves regional air quality. It is a place with proper mixing land uses and activities: there is the possibility of providing basic necessities for shopping, Health and Education, employment opportunities and in total relative self-reliance. Residents engage in a variety of economic activities including farming, small scale industry, tourism and other fields and necessary infrastructures for making different fields of employment including agriculture, handicrafts, livestock, etc. are provided. Therefore, as social, recreational and cultural places have power to attract people and at the same time give services to local residents, neighborhoods, regions and tourists.

it is a place with physical features, determined dimensions, with clear stationing way from the neighborhood so an urban village is small to the extent that in which the neighborhood concept is felt, and it strengthens the sense of place and increasing in social interactions and face to face confrontations and at the same time, is big to an extent that have the ability to supply a wide range of facilities in a convenient and logical way. The pedestrian ability is the main criteria to act in availability to daily and sometimes weekly uses. On this basis, the maximum available radius of 600 meters, is considered [3].

Study domain

Moradbeig Valley settlement is located 3 kilometers away from the center of Hamedan that is settled in one of the middle valleys of northern slopes of Alvand Mountain in a special mountainous position. This region is stretched from north to south and is limited by the elevations from the West and the East. The average height of this region is 2050 meters above sea level that is located 228 meters above the center of the city of Hamedan. The height difference that this Demographic point has, compared to the center of Hamedan, has caused relatively cooler temperature than other parts of the city.

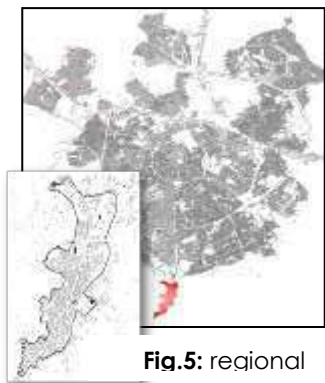


Fig.5: regional

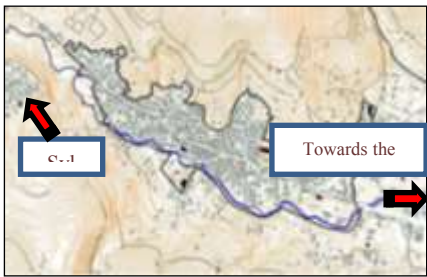


Fig. 6 : regional

On the east side of it, the river Olusjerd flows, and the Silvar village is located in the south of it. Fertile soil of the region and existence of adequate water has provided suitable conditions for horticulture territorially. Cool air of mountainous settlements in the warm months and desire relative humidity with existence of suitable vegetation, provides a suitable climatic conditions for recreation and spending leisure time and tourism in the warm months of year which is rare in its own kind. Length of the region from the viaduct of Moradbeig valley to the end of that is about 1,400 meters and according to the formation of the region in the valley and construction limitations due to high altitude and rivers, expansion of the city was taken place to the mountains in places where the slope is less, and residential buildings penetrated into the mountains, in areas where construction is not possible, the width of the region is reduced. In Above Map Moradbeig valley width has been determined from a distance of 150 meters before the Baharestan Square in form of each 200 meters.

System of land use and activities

Present land use

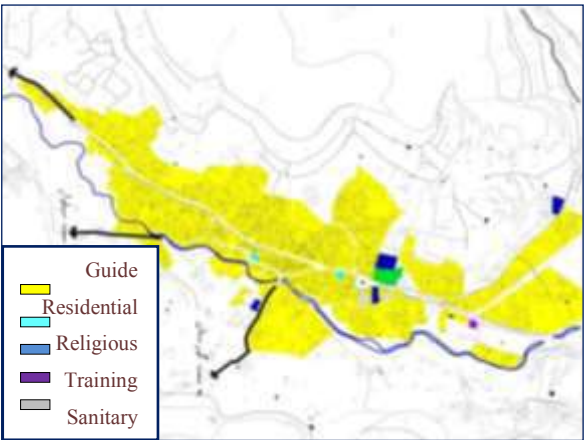


Fig. 7: user status quo

Table 5 : Area and per capita status quo

Percent	Capitation	Area	user
87/18	49/25	311105	Residential
1/50	0/76	5388	Training
0/11	0/06	415	Health
0/18	0/09	674	Religious, cultural
11/03	6/21	39254	Passages

Baharestan square chamber activity and the main axis are in form of mixed residential commercial.

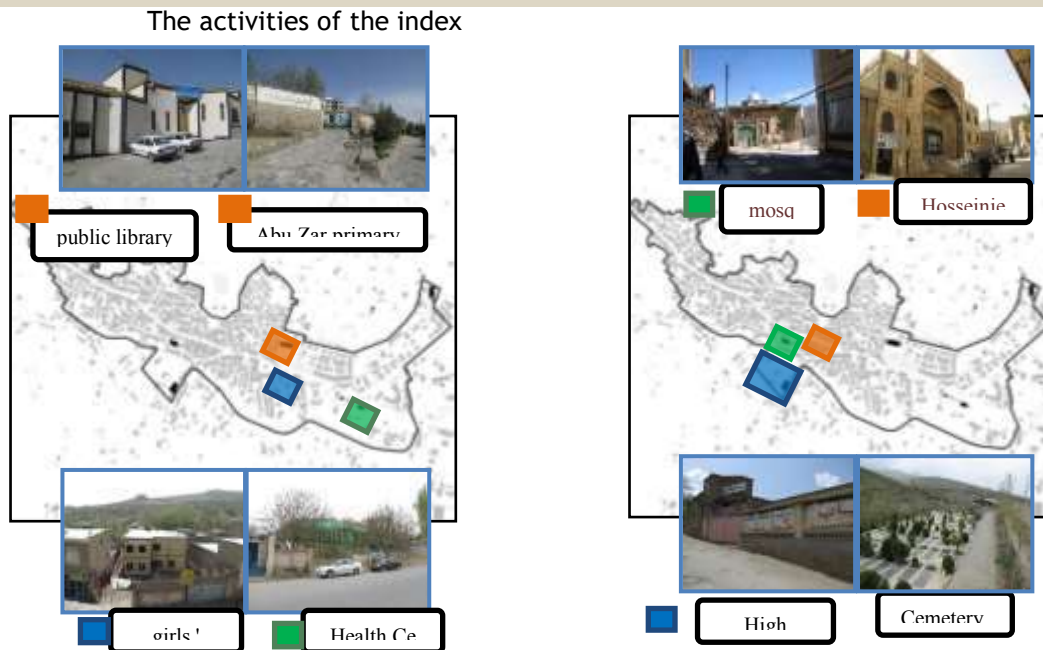


Fig.8 : the activities of the index

Natural order

River

usjerd River flows in the southern, southeastern and eastern part of Moradbeig valley. This river is one of branches of Abshineh River that originated in northeast slope of Mount Alvand and has the direction of southern northern and after irrigation Silvar villages Moradbeig valley crosses Hamadan and joins to Khezz River in the village of Gara Choqa. The length of the river of Moradbeig valley is about 18 km and extension of its basin is approximately 30 square kilometers. This river has a permanent regime .this river is in open roof form and has natural wall and bed. This river after getting into town becomes roofed channels and after going out of the city becomes open roof. And goes into downstream agricultural land, and after irrigating agricultural land connects to Devin River and continues the path to the north. Runoff available at rivers due to urban sewage evacuation as well as entering subterranean water into this river several bridges has been constructed on Moradbeig Valley River. floor of the river is natural and stony .The walls of river is natural and with various vegetation covering along the route and at certain intervals channel walls are covered with cement mortar and rubble and improved. Calverts have different dimensions along the path in built bridges' position. Along the way, construction and household wastes are seen. Also sewage system output of village discharged into the river completely. Of course, all the waste water by irrigating streams are driven from river path to the gardens and agricultural land around the river.



Fig. 9: River frontage situation

Vegetation covering, in some parts of the river, is very dense. In a way that, the river bed is not visible. The effective width of the river is 3 km and its depth varies and is almost equivalent to 2 meters. Territory of this river is 24 meters which unfortunately in construction Moradbeig Valley area, this territory has not been observed.

System of physical form to survey Buildings Architecture

Architectural style: This area has a rural texture and includes buildings that were built in different periods of time and have different features, and they have not a specific architectural style. Orientation of buildings: according to natural limitations and climatic features, buildings in this area have been made in Western Eastern direction and the openings are in East side.

The analysis of research findings

Evaluation and selection of optimal conceptual choice

With regard to the goals and policies presented in the study, proposed alternatives, on the basis of the five urban form is presented, followed by a rating based on macro and micro objectives, and considering the significance of each of the options objectives, provided an overall score each option is determined, and the optimal variant is chosen. In order to offer proposal plan considering urban village approaches, in order to achieve this goal, Moradbeig valley settlement was divided into two different regions (areas), in which the first area, an area of approximately 21 hectares, due to proximity to residential texture of Hamadan and empty land and other facilities for the development etc. urban design is presented with renewal approach, and the second area with approximately 28 hectares, urban design is presented with development approach to preserve the rural texture and organic of Moradbeig Valley etc. In this study in order to analyze the data through qualitative methods SWOT, integrated analytical framework based on three-dimensional urban design and master plan is used so that after the identification of Hamadan and settlements, Moradbeig Valley as a case of study, in order to accurately assess the mutual impact and inspiration of two strategic area and local areas, in recognition phase of studies, in the form of five layers of urban form including user and activity system, movement and accessibility system, the framework system of public spaces, System of physical form and the urban landscape system, action has been done. And we tried to provide strategies and suggestions to pulling out city from the contamination and the physical and visual chaos and achieving sustainable human settlements through the application of principles and concepts of urban village. In this study four domains has been designed in form of specific areas in five system, and principles and specific criteria have been proposed for each one, which is from the subject areas the first area as an example (edge of river) Has been studied.

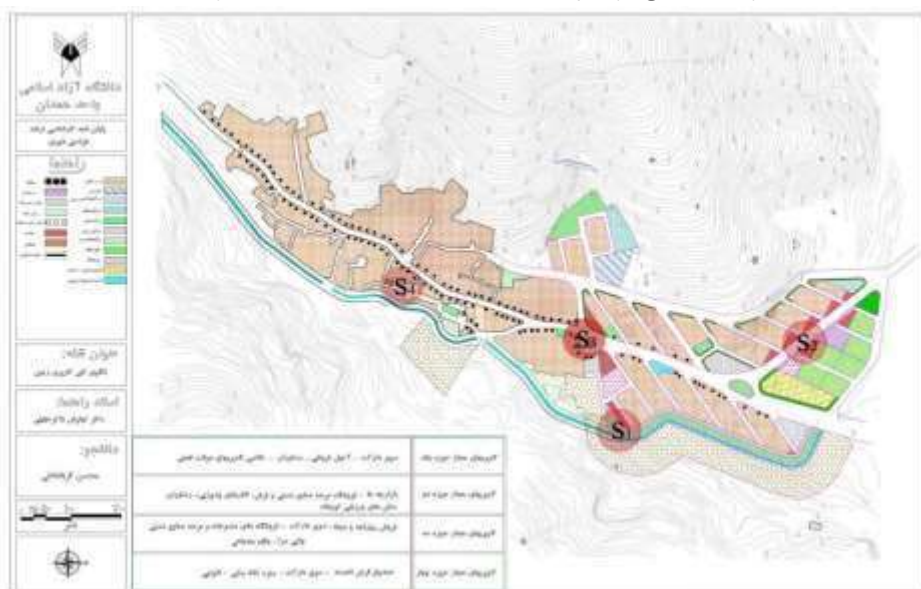
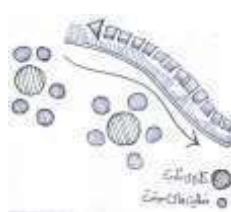


Fig.10: the introduction of public areas and design specific areas

Special area's conditions S1 (River's Edge)

Modernization of marginal urban water including recovering river's natural system, development areas of side water or both of them again. Restoring natural systems such as rivers' margin and streams territory leads to a healthier environment and prepare the conditions for the activities. Design of water next to the

city should be a set of principles, flood control and environmental design strategies that could cause development in river's ecological systems.



System performance and activity

It is recommended that any constant uses in its surrounding provides a better base for compatible temporary activities. Temporary activities such as street vending, theatrics and drama, provided to compliance with core activities should be encouraged.

Physical system

For body of the river it is better to use natural materials such as sand and gravel. The maximum number of storeys on the edge of the river 2.5 floor and in the case of wrapping property on a steep slope maximum 3.5 floors can be built. The establishment of temporary structures and style is essential in the form of canopies and pavilions.

Movement and access system

At the length of walking path by the river's edge, urban furniture should be placed in a way that would not interfere with the ease of commuting on foot. Pedestrian path must be create with the width of at least 3 meters along the route, and continue along the axis. The route must executed with the lowest ups and downs and as far as possible without stairs. In case of requirement of building stairs, the disabled people

route must be seen. Ability to move across the river must be provided. Territory of river must be considered 24 meters. All buildings constructed in river's territory should be destroyed.

Urban landscape system

- To locate community centers along the river's edge should be performed according to the views fit into the surrounding landscape.
- To create diversity in the color palette of facade, the use of materials such as colored stones, colored cement and ... with warm colors is recommended.
- Facade building of all visible glazed is required.

Public spaces system

- Furniture Design, for all parts of the river's edge ,should be done in a way that encourage a diverse range of activities.
- Lighting river's edge must be in a way that provide the security of presence in space to the public at night and create a pleasant environment.
- Locating street furniture and vegetation covering is recommended in combination with each other so that make a variety of fields to understand the scale of walking in passages.
- Gender of living dungeons should be of non-metallic materials such as wood . it is obvious that this is in line with increasing opportunities for making social interaction.
- Shaded areas, through drawings or vegetation, must be allocated to pause and stand spaces.
- Construction of furniture to sit is allowed at two locations:
 - The desired aesthetics towards city and its natural scenery
 - Spaces with the appropriate shade during public gathering

Five general principles is proposed for the success of the project:

General Principle 1

The ecological objectives and economic development have mutual benefit. The public and private development that attracts people near the river to live, relax, eat and participate in cultural activities creates a sense of connection and belonging to the river. The rivers that have lively and suitable performance have many attractions for residents and merchants. People who enjoy activities and characteristics of the river are also concerned about its long-term health.

General Principle 2

Protection and restoring the natural river Components and Functions Rivers provide natural vital interests for us which should be protected. Natural features of rivers such as twists and turns, canals and edges with gentle slopes, have essential ecological functions. They also have benefits for humans which contains healthier water and preventing from the spread of floods. In many urban areas it is possible that the recovery of natural elements couldn't not occur, but even the slightest effort can also have many results. Improving environmental conditions even in the side water that have been strongly influenced by urban development, is also possible.

General Principle 3

Restoration of side water as a human realm A side water development project should overcome physical, political, social and economic barriers in order to increase public use and enjoyment from this public source. Side water successful plans have considered requirements of different groups of residents in different ages and cultures. They make it possible for residents to experience the river closely.

General Principle 4

To achieve multiple objectives we should act balanced .urban side water often located in places that there are competing interests over them. Exclusive emphasis on economic development alone, or environmental concerns, by no means, is not desirable. But they must be considered together. Due to existing development, a few towns have the ability to create a completely natural side water. On the other hand the development that aimed at improving the economic conditions should not hurt side river natural features, or limit public access.

General Principle 5

It is better that the design process of side water to be done participatory, to the greatest possible extent, Design and planning of side water must be accompanied by broad participation of people. This process must go beyond the usual stakeholder groups and residents who normally have not used the river side, should also be included. Needs of different communities are variable and, in case of compliance with these priorities, side project would have liveliness, inclusiveness and more success.



Fig.11: a comprehensive plan for the next three urban planning for the field

CONCLUSIONS AND PRESENTING STRATEGY

Urban development pressure on the region and daily increasing constructions in the range (external threat), not only is a threat to organic texture but also is the cause of environmental degradation and turning upset the equilibrium of region's nature. Thus, by improving the quality of life and meeting the needs of context residents, it has been prevented from migration into the city. Urban Village approach, since it offers principles of a special design for more small-scale neighborhoods than the city and often located in the ecological context, taking into account the certain population and the specified and desired size for settlements, has defined and limited development in a defined scale practically that this caused the prevention of future settlements dispersed development. Urban village designing has caused attention to sustainable communities with focus on attention to the human dimension consistent with the preservation of the natural environment and led to the creation sustainable and humanistic tendencies. The result and outcome of these experiences has led to valuable goals that the most important of those is attention to human and human values which has created more efficient communication of humans and the environment, and has led to the sustainable development of human settlements. Benefiting from studying successful experiences, architectural guidelines, landscape architecture and practical urban design of urban village of Pond Barry and Kelvin Grove in the successful application of this concept and its features, according to local conditions of Moradbeig Valley area for achieving to strategies of sustainable realization in stable settlements in the country, following suggested solutions, are offered:

Application of the principle of mixed uses

To achieve a level of self-sufficiency in urban village, one of the strategies to achieve a holistic approach in the current situation in Iran is the application of the principle of mixed uses, and define new functions, based on role of settlements in the region. On this basis these new functions that are compatible with each other, are defined depending on the historical tourism and cultural role of the region. Also in harmonious balance between industry and agriculture, namely the concept of integration of urban and rural settlements performance, that combines the industrial spirit of city with the farming spirit of the village, and realizes partly self-sufficient settlements.

People participation

The most important principle associated with the development is emphasized in this approach. Public participation in project development model, and most importantly, is the relationship between providers and residents of the region and believing in that the realization of development projects in order to achieve sustainable development, is collective and universal, and is through participatory planning and implementation. So that should be managed constantly through people and inhabitants. Through the continued application of this principle, resistance against changing will be reduced and strategic planning discussions can develop in more open lines. Also, emphasis on native elements especially in terms of cultural and social properties and social traditions is of proposed principles of strengthening the identity of settlements in the current situation in Iran.

The use of compressed form with suitable development space

Due to the efficient use of land, development pressures on agricultural and natural land will be reduced, and spent energy on travel and also in the building will be reduced, and by reducing traveling by private cars, the air quality in the region will be helped. In these circumstances with the efficient use of land and energy resources, compared to the places where these resources are scattered, development pressures on farmland and open spaces will be reduced more effectively. Besides, more diverse and stable architecture will be generated with different types of ownership in lands and new creation technologies such as the cases discussed in this article, and the use of clean and renewable energies, as much as possible, will be used in buildings.

The principle of the diversity

This principle is one of the core principles (in particular in architectural pattern and density of buildings) that should be considered. Also organizing of local and ultra-local access is recommended on the basis of urban village's principles, with pedestrian priority and emphasis on native elements, in terms of physical forms in the neighborhood units organizing. Essentially, the application of urban village pattern needs for technical expertise and comprehensive knowledge of local features of each case to adapt model designing principles in every area. Undoubtedly, in a successful urban or rural development, one of the goals of the planners and designers is creation of a balance between development and conservation. Application of proposed principles, in the Urban Village Model, has the ability to make this equilibrium and balance, and it seems that achieving to a comprehensive understanding of this procedure and more comprehensive and more perfect study of it can be a convenient and efficient way in controlling development of urban and rural areas. Also, the idea of urban villages, with strategies for designing principles of sustainable settlements, can prevent from irregular development of suburbs and villages seriously. In the meantime, one of the goals of urban villages that is the development of sustainable housing, should be considered. Because designing sustainable housing, as the core of planning, can over shadow foundation and basis of design. To achieve stable housing, design principles and related concepts should be identified, and influencing factors and problems of its realization should be explored. As a basic matter, it can be said that any policy and planning for rural housing in the country can be close to success when that the plans and actions are compatible with the features and characteristics of rural architecture and ethnic and cultural traditions and existing climatic diversity in different parts of the country. Lack of segregation of strategic and operational policy of urban and rural housing, and generalizing strategic policy of urban housing to rural areas, is one of the most important qualitative inability which is seen in the rural housing programs, and its continuation has led to revealing the signs of urbanization of rural homes in the face of the village now. Among other shortcomings in strategic policy realm, which regarding them for the realization of programs is necessary, we can point at the lack of local architecture system, finance - credit system, founding technical institutions which are overseeing the construction, providing residential land, organizing materials producing, and dissemination of appropriate technology for construction. Neglecting other qualitative aspects of house such as environmental aspects, health facilities, light, manufacturing technology, visual qualities, and local-regional identities and climatic geography are considered as a tangible gap and of the most important weaknesses of rural housing programs. Reflecting on patterns of vernacular architecture and reliance on resources and local knowledge can be a good start for designing and executive thinking in this field.

CONFLICT OF INTEREST

There is no conflict of interest

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REFERENCES

- [1] Pourmohamadreza N, Sarah H. [2007] Stability in the city from yesterday to today", seven city, *Journal of Urban Planning and architecture*.
- [2] Bell David, Jayne Mark, (eds.). [2004] City of Quarters: Urban Villages in the Contemporary City, Ashgate, Basingstoke, Hampshire, ISBN.
- [3] Bahrain Hussain, Hajibandeh Mona. [2011] Urban Village Model: An Efficient Approach to Achieve Sustainable rural settlements (Case Study: Mianlab village located in the area of Safarood of Ramsar city), *Journal of Housing and Rural Environment*.134:74-49.
- [4] Mofidi, Seyed Majid and Yamani Parisa. [2008] Urban village a model for sustainable urban development, *Journal Abadi* eighteenth year. 60: 59-56.
- [5] Bahrain Hossein. [2008] Comparison of the concepts of development and sustainable development", *Proceedings of sustainable urban development*, compiled by B. Amin Zadeh, Tehran: Tehran University Press
- [6] Thompson-Fawcett M. [1996] The urbanism revision of development. Urban design International. 4. www.indigodev.com/Sustain
- [7] Aldous T. [1995] The Economics of Urban Villages. London: Urban Village Forum.
- [8] Aldous T. [1997] Urban Villages: A concept for creating mixed-use urban developments on a sustainable scale. 2nd edn London: Urban Villages Group
- [9] Neal, Peter. [2003] Urban Villages and the Making of Communities. Spon Press, London and New York.
- [10] Fleming, Randall. [2000] the Case for Urban Villages. Viewed on [2007], <http://www.fscr.org/index.html>.
- [11] Lock David. [2003] Planning for Sustainable Communities in Urban villages and the making of communities. London: Spon Press. 50-62.
- [12] Franklin, Bridget. [2002] constructing an image: The Urban Village concept in UK. Cardiff University.
- [13] Bahrain Hossein. [2008] Comparison of the concepts of development and sustainable development", *Proceedings of sustainable urban development*, compiled by B. Amin Zadeh, Tehran: Tehran University Press.
- [14] Jacobs Jane. [2007] Death and Life of Great American Cities, translation by Parsi Hamid Reza and Aflatooni Arezoo, Tehran: Tehran University Press
- [15] Tabibian Manouchehr. [2008] City and criteria for the realization of a sustainable city for reducing environmental impacts, *Proceedings of sustainable urban development*, compiled by Behnaz Amin Zadeh, Tehran: Tehran University Press.
- [16] Sucher David. [2003] How to build an Urban Village. City Comforts Press.
- [17] Pakzad, Jahanshah. [2006] Theoretical principles of urban design process. Tehran: Shahidi Publication.
- [18] Fleming R. [2000] the Case for Urban Villages. Viewed on [2007], <http://www.fscr.org/index.html>.
- [19] Mofidi Seyed Majid, Yamani Parisa. [2008] Urban village a model for sustainable urban development, *Journal Abadi* eighteenth year. 60: 56-59.

ARTICLE

THE ROLE OF STRUCTURAL ELEMENTS OF PERSIAN GARDEN IN MENTAL HEALTH

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ABSTRACT

Human beings have a direct and close relationship with their landscapes and environment. They, therefore, set their knowledge and beliefs based on their understanding of surroundings. Human beings are the only creatures who consciously change their environment to enjoy its beauty. That is why humans have focused their minds on organizing and arranging their observations and induction to make sense of the world around them and to change the landscape in aesthetic patterns. Landscape architecture has different architectural approaches. Geometry, symmetry, texture, and all other aesthetic values are seen in landscape design, like all other arts. In this regard, the functional approach of landscape elements can be examined from another perspective, i.e. the impact of landscapes on individuals' psyche and mentality. The relationship between landscape and human has always been of high importance in different sciences worldwide because the role of green spaces and a healthy nature in relaxation is axiomatic. It is a unique human characteristic to enjoy landscapes and nature because human is naturally interested in nature and becomes tranquil in it. As a result, landscape architecture is not applied only to make the environment beautiful but to design the natural elements in a way that they do have a good impact on the psyche of people. This study aimed to investigate the structural elements of Persian gardens and their positive impact on people's mental health. The clever combination of water, plants, and space in the Persian gardens attests to the fact that the original concept and legacy of the Persian gardens all root in human comfort and tranquility.

INTRODUCTION

Garden was presented as a kind of architectural interpretation over a few decades ago, but today it is regarded not only as a work of architecture but also as a substantive principle which plays a significant and influential role in shaping the natural environment. The remarkable effects of nature on humans' physical and mental health are so noticeable that they can relieve stress and tension, reduce anger and hatred, increase happiness and life expectancy, and also help humans brush aside 'the dark and disturbing thoughts'. Research shows that the clean nature and green spaces can be very effective in terms of human health so that they can reduce the level of stress hormones, hence low blood pressure, heart rate, and muscle tension [1].

The Persian garden is a place for inner peace and comfort as well as contemplation and reflection. It is a place to purify the tired soul of human, to make the human psyche fresh and smooth. Undoubtedly the impact of such gardens cannot be ignored [2]. Gardens and garden-cities can be viewed and interpreted from different aspects: a location and an outlook that dominates the city— a place which protects itself against the wrath of outer nature— the fixed geometric design of garden— or, the fragile architectural design of Kushks [1].

The Inner Concept of Persian Garden

Persian garden has been a symbol of paradise and one of the most outstanding architectural achievements since the Achaemenid Iran. Traditionally, Iranians would consider garden as the material and earthly manifestation of a spiritual reality; this concept has been mentioned in many philosophical books as "the shadow and reflection of the heavenly world in the universe". That is why the design and geometry of the garden are associated with cosmology and philosophy and they are not limited to the experience of the mundane world. A person who has spiritual talent and discernment and holds a belief in the truth of the heavenly world will have the ability to create such gardens and therefore this art is regarded as 'sacred'. This does not mean that heaven has been nothing but a memory or an image of beautiful earthly gardens in the minds of ancient people; on the contrary, it means that the earthly gardens in Iran have always been known as the shadow of Paradise [3].

Definition of Persian Garden

In Islamic Encyclopedia the term 'garden' has been defined as follows: "an often enclosed area made by humans which enjoys flowers, plants, trees, water, and special buildings that are based on the geometric rules and different beliefs. Generally, the Persian garden is a historical, cultural, and structural phenomenon in Iran, usually built in a limited area where water, plants, and buildings are combined based on a specified architectural system creating a favorable, comfortable, and safe environment for humans" [4].

KEY WORDS

Persian Garden, Mental health, Garden elements

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Fig.1: A view of a Persian garden (photo by: YusefSaeb)

Elements of Persian Garden

In order to come to a better understanding of the Persian garden, this paper introduces another aspect of this garden which needs a profound insight through which we move from the general form to elements that play the main role in the formation of the garden. The garden space is created by such elements as well as the steps and measures that are taken by its creators and builders. Taking an abstract look to the garden, one will find out the basic dimensions of human intervention in addition to relying on simple basic elements of water, air, soil, and sun as life-essence issues in forming the garden. In some areas, though, this human intervention often turns the lush normal nature to a man-made one. Human takes the fertility from the soil, the gentle breeze from the air, and the glorious brilliant sunshine from the sun. She then adds to them the element of water and gives serenity to her living environment. Each of these four elements, both separately and in combination, has its own special place in the formation of the Persian garden. Such elements and their final product, i.e. the garden, help us come up with the idea of creating a pleasant environment [5].

Not only are these four life-creating elements involved in creating the garden, they also affect the garden in regard with their intra-interaction they have together between themselves. The result of these observations is a set of components and elements which are regarded as the structural cornerstones of the garden construction. The first and most fundamental element of creating the garden is water which is vital and without which, of course, the concept of the garden is meaningless. The second element is plant without which the perception of the garden is impossible because the garden takes shape based on the shady and fruit trees, shrubs, and bushes. These architectural elements, then, create structures which give the garden a logical order and sturdiness through which a space like the Persian garden is formed. Finally, it is the soil that in its broad sense encompasses earth, origin, and (plant) beds. The Persian garden is formed from a combination of the basic elements within a systematic pattern. However, there are some side elements which should not be overlooked as they help achieve the final result [5].



Fig. 2: Plant and architectural elements in the Persian garden (geolocation.ws)



Fig. 3: Water and architectural elements in the Persian garden (orujtravel.com)

To make a more precise definition of the basic elements of the garden, we must take into account the importance and necessity of each and every one of these elements. So the basic elements, based on such definition, are the ones which a garden would never come into existence without their presence. These elements are water, plant, air (space), and soil (land). When they come together within the conceptual framework of a garden in an Iranian intellectual and architectural system, a Persian garden would be the result [6].

Tranquility and Comfort of Persian Garden

The relationship between human health and landscapes has always been of paramount importance in different cultures and societies. Natural and unnatural elements along with five senses all make it possible for human beings to explore the environment. The belief that the auditory, visual, olfactory, tactile, and gustatory senses such as hearing the sounds of birds and water, seeing the lush grass, green plants, and colorful flowers, smelling the pleasing scent of foliage, touching petals, and tasting flavors all affect the human senses, and result in reducing stress, has been studied in early Asia, especially in China, and also in Greek and Roman cultures [7].

Studies also reveal that too many factors, or variables, such as weather, light, and sound are effective in planning and decision-making in order to enhance mental health [8]. In fact, the Persian garden causes a healing effect in humans and reduces the stress of everyday life through the communication it establishes with different senses in humans. So, the healing Persian garden's secret of success is related to human inherent tendency to nature, peace, and a sense of life and living [9]. Human beings, naturally, react well to the environment and the green nature and this type of attraction to the environment is called 'soft fascination' [10]. The nature draws human attention or fascinates people. This directed fascination which is controlled by an operating system, makes human relax and causes the negative thoughts to be replaced with positive ones. The longer this situation, the more important issues, such as one's objectives, priorities stimulated to help find a new direction and a new sense in humans [11].

MATERIALS AND METHODS

This research applies a qualitative content description to introduce the structural elements of the Persian garden, i.e. water, plant, land, and space. Moreover, doing library and field research on the Persian garden, the aesthetic and functional elements and dimensions as well as the psychological impact of the Persian gardens on humans have been investigated.

Water, the Most Important Element in Persian Garden

Having been very cleverly and artfully employed, water has always been considered as the most vital and most crucial element in forming the Persian gardens. Not only is water regarded as the most fundamental element as

it is used for irrigation and watering of garden plants, it has been used to show the conceptual, poetic, and artistic dimension in order to adorn the garden space with its freshness, vitality, beauty, and dynamism [12].

The presence of water in the garden is based on specific concepts; its flow is also based on principles which are, on the one hand, dealing with the physical and technical characteristics of water and irrigation. On the other hand, they pay heed to aesthetics, conceptuality, landscaping, and architecture [13]. Indeed, the architecture of the Persian garden is the architecture of water. The togetherness of water and plants creates a unique poetic, musical, and glorious scene in the private life of trees. The water flows in a measured and thoughtful way and remains still in pools and around fountains. It paves its way through high fountains and makes the garden fresh with its movement, sound, and elegance. The inflow of water has a special system which is consistent with the geometry and structure of the garden and it takes various forms in different types of Persian gardens [14].

In general, the presence of water in Persian garden is a combination of two sensory and physical forms. More than anything, the story of the Persian garden is the tale of water flow and streams of life after surviving drought. Gardens in the deserts are somehow interpreted as 'flirting with the water'. The nature of water, either running or at rest, is very soothing and its musical caressing sound has always been pleasant for humans. No doubt the pleasing and relaxing sound of water gives everyone natural enthusiasm and a desire to live. Another influential factor of water is its visual dimension which plays a reflection-role, i.e. a mirror in the garden. The placid and still water in the pools reflects the image of elements, spaces, and even the sky. This reflection has its own beauty; so has the pleasant sound of the water as if the heavens are down on the earth and a celebration is being held [15].

Creating gardens on sloping beds and even step-like obstacles in the way of water current both make the gentle flow of water be faster and more resonant as it is running down the stairs on stairs. This is the most beautiful song of praise-whispering water which becomes even more dulcet as it moves up the fountains along its route. All these are to make this soothing sound and image be more heeded. Furthermore,

streams and small and large pools in the gardens play a key role in providing the green spaces the way water should flow in the gardens. They also create glorious splendor in the make-up of the gardens. In most cases, the construction of stone-made streams and pools manifests flow and movement in life, and the reflection of sun on the water of flowing streams and small waterfalls creates images of beauty as well as the pleasing sound which whispers tranquility for the residents [6].

Table1: The role of water in Persian garden [16]

Presence of Water in Persian Garden	Function	Effects on the Garden
Primary and secondary streams	water supply, they transfer water to different plot levels and different gardens	forms mobility and dynamism in the garden
AbGardan ¹	circulates water in the garden	keeps the water flow at a limited level to highlight and display it more prominently
Small and large pools	saves water	creates a pause in water flow and mirrors the sky
Water squirt	a fountain in the water	it causes the water to squirt out and creates the splash sound
Partridge chest ²	forms waves on the water surface	shows the volume of water, makes the surface of water appear more beautiful, and creates a pleasing sound
Fountain	causes the water to move upwards	attracts attention, plays with water resulting in creating waves on the surface of the water, and makes a sweet sound
(camel throat) ShotorGalo ³	makes a difference in water pressure and causes the water to flow effortlessly	decks the water flow with its effects
Stepped fountain	is used in steep slopes	creates attractive small water fountains at different water levels

Plants, the Most Fundamental and Decorative Element of Persian Garden

Plants are the most important constituent elements, also known as the decorative elements, of the Persian garden [17]. Garden plants, in general, are used to bear fruit, to give leafy shade, or to decorate the area [18]. Green spaces can help reduce personal stress and social tensions. This feature can be seen as a balancing variable whose relationship with negative thoughts and forces will lead to an improvement in mental health [11].

Selecting plants in the Persian garden is based on emotional stimulation. There is foliage of trees and shrubs in the background of the Persian garden which are seen in colors and there are also aromatic plants that stimulate the sense of smell. Vast areas of beautiful green grass and mature trees with deep shades or the trees that define limits and somehow arouse our senses all provide us with relaxation, self-awareness, and a stress-free environment [19].

The coexistence of different plants together along with planting trees as filters for the dry climate outside the garden are among the goals of using plants in the Persian gardens [15]. Greenery planting minimizes the harshness of synthetic elements and creates a rich sensory environment which provides a pleasant individual perception and therefore it results in a good mental health [11]. Flowers and plants, enjoying their many colors, create various color combinations in different seasons. This feature makes a distinction between the Persian gardens and those from other lands. Moreover, different combinations of fine or

coarse textures are created which affect both the visual sense and the landscape, and also foster diversity in sense of touch [20].

The diversity of flowers in the Persian gardens remained from the Safavid era is more eye-catching because a large variety of flowers were brought in from the West [21]. In addition, the planting and growing of colorful flowers has a powerful effect in mind so that flowers with warm colors bring happiness, excitement, vitality, and dynamism and flowers with cool colors make the garden look larger. So, the type of color and the effect it produces on mind can be among factors which are decisive in how a garden should be used and also can lead to users' dynamism or even stability [18]. Understanding the shapes, forms, colors, and textures of flowers and plants results in regulating human senses; this roots in human sensory tendencies that guide a person to focus on his surroundings and also invite him to the natural environment [20].

Medicinal herbs are a part of nature and have been an inseparable side of the colorful world of plants since the beginning of creation. There is a medicinal herb for each disease in nature and as people move closer to nature, they become calmer [22]. Studies on medicinal plants have shown that the knowledge of medicinal plants and their use for the treatment of diseases roots in the Orient and has had a great influence on the history and evolution of research and scientific developments as well as on the treatment of diseases and identification of medicinal materials [23]. In addition to its own beauty, a landscape which contains plants is a wealth and a treasury for mankind because it is a supply of food and pharmaceutical products for human beings [24]. Not only do medicinal plants grow wild in nature, they are cultivated by human beings. Therefore, the fragrance of these plants and essential oils stimulates the nervous system and causes peace and psychological relief. Various species of medicinal flowers and herbs such as silk flowers and scented eglantine, depending on their aroma and health benefits, have a special place in the Persian garden [25]. The place these plants were usually cultivated in the Persian gardens included the middle parts of plots and Bonegahs (leafy shade rest areas) [20].

Animals and birds are directly attracted to the garden plants. The birdsong breaks the silence and along with the sound of the wind among the trees, they create a beautiful melody in the garden [22]. Flowers and plants attract birds and provide human beings with the opportunity to listen to the orchestra of the nature, i.e. to the sounds of rustling leaves, the mellifluous birdsong, and the dulcet tone of pleasing breeze in the trees. This natural orchestra sweeps away the daily stress and tension [19]. One of the most gratifying pleasures for Iranians is to walk in gardens listening to the song of nightingales [26].

Land

Land is also one of the major elements in forming the Persian gardens. In addition to its overall shape and position, land is affected by factors such as differences in level and slope, soil type, irrigation, and fertility. One of the reasons for creating a garden in steep terrain, for which there are many examples, is the possibility of water running through the garden naturally. Furthermore, the steep terrain determines the geometric orientation of the garden. "A sloping land is a necessary condition to water gardens so that the orientation of the garden is also shaped on this basis. The geometric system Iranians have employed for irrigation is the most accurate and provides the easiest way of watering [27]. If the garden is created on a steep land, it will make it possible to build water fountains and small waterfalls as the land is in various levels. The Persian garden is not an open area and is a land surrounded by walls so that no one can see it from outside [25]. This enclosure helps define the garden better. Inside these walls, everything is calm. The garden is a fixed point in a changing world. Designed by human, it is, however, a field with constant subtle changes and a precise balance [14]. Taking the specified garden limits into consideration, other defining elements in different orientations come to mind. These elements are tower-fortifications on all four sides of the garden while the sky plays the role of the roof on the garden. The sixth side is the ground which defines the look of a floor in the garden. The tower-fortifications have heavenly manifestations and convey the meaning that the garden is beyond the material and mundane world. The garden is a carved or relief-shaped image on the ground and plays a prominent role in presenting a heavenly image of the garden [6].

The land, as the garden floor, has the following forms:

1. the garden paths, including the main and minor pathways
2. the plot levels
3. the bed of water structures, including pools, streams, and creeks
4. the bed of garden indoor and outdoor spaces

Therefore, it is found that the land is a structural element in shaping the Persian garden and plays a leading role in defining the spaces and the formation of other elements of the garden. In fact, the overall shape of the garden can be traced in the land and the changes it has undergone because the land is a solid base for other elements of the garden; plants would grow in the plots, the water would flow in streams and would run into the pools, and the walls and towers would show their strength, all because they would proudly stand on the land to create a beautiful garden [6].

The way the garden has been situated shows that the land has been formed as a bed based on which the garden takes its favorable position. In order to enjoy the open air, light, water, and soil, the Persian garden

needs a place which is exposed to gentle wind, breeze, sun, fertile soil, and, of course, the vital factor, i.e. water. It is obvious that the land is inevitably involved in creating these conditions [5].

Garden Space

Persian garden is an area enclosed within walls or the so-called boundary between the world inside and the world outside. It has cool shade and high ambient humidity which eventually creates a pleasing milieu in the heart of a hot environment [28]. In a specific architectural system, plants, water, and environmental buildings are mingled together and provide human beings with a relaxed and comfortable environment [20]. All spaces have independence and identity in Iranian architectural design and are consistent and purposeful [21]. The shady tees, for example, are planted around gathering or rest places in the garden. Such places are called 'Bonegah' (leafy shade rest area) that is a sitting place in summer. In the Persian garden, texture (make-up), form, color, and function cause diversity. The lack of such diversity brings about monotony whereas its overuse leads to confusion. This 'multiple-space, diverse landscape' feature makes an individual exhibit a positive response to the environment [20].

The Persian garden enjoys: a combination of simple and harmonious elements, an exact and consistent relationship (between these elements), a specified geometrical system, perpendicular lines, a directed melodious water system which runs through indoor and outdoor spaces [16]. The artistic-structural system of the Persian garden is not used just to physically shape the garden, but also creates abstract imagery and shapes in human mind which should also be studied because geometry addresses very serious issues such as order, relationships, and landscapes; this, therefore, will establish the relationship between the garden and the mindset of people. When we stroll along the Persian garden, the farthest point in the garden would appear to be the closest. This is geometry, but the one which human mind is able to understand [29].

CONCLUSION

Having a healthy and peaceful environment would certainly bring human beings development and prosperity in the world and would help them foster their body and soul. Having a healthy body and soul is the product of our environment. Human inclination to the nature is axiomatic, so a healthy environment has a significant impact on the human spirit. Since Iran is a dry country, the psychological effects of water and plants, and the nature in general, are more remarkable on Iranians.

Challenges of urban life and industrialization lead to stress and stress-related diseases. According to studies, there are ways to reduce stress and enhance recovery using the natural landscape. Wherever there are trees and water, one can certainly hear the birds singing, hence a more pleasant environment. So planting trees, shrubs, and flowers would help birds enter the environment and would drive the monotony out. Hearing the birds singing, listening to the soft melodious rivers and springs, enjoying the green grass and groves, touching the breeze, watching the trees dancing and shadows and light playing, all have amazing impact on human life. Watching such a beautiful landscape brings joy, peace, security, and comfort for everyone.

This paper described the structural elements of the Persian garden and concluded that the architecture of the Persian garden was effective and influential in human mental health. Considering knowing human, his needs, his relationship with nature and role of nature on his mental health, there still remains a question: How can a landscape affect human mental health? And can this effect measured by Quantum

CONFLICT OF INTEREST

There is no conflict of interest

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None

REFERENCES

- [5] Mirfendereski, Mohammad A. [2001] The Garden in the Concept of Garden, seven cities, 2(3):5.
- [6] Jeyhani, Hamidreza, Omrani, SeyyedMohammadali. [2007] Garden of Finn, cultural heritage research center, hand-made artifacts and tourism.
- [7] Velarde M, Fry G, Tveit M. [2007] Health effects of viewing landscapes - Landscape types in environmental psychology. *Journal of Urban Forestry & Urban greening*. (6): 199-212.
- [8] Naderi J, Raman B. [2005] capturing impressions of pedestrian landscapes used for healing purposes
- [1] Faghih N. [1991] Feature of Persian Garden, *Journal of Irannamleh, Autumn ed.* (36): 565-588.
- [2] Pope, Arthur. [2009] Iranian Architecture, translated by GholamhosseinAfshar, Akhtaran Publication.
- [3] NasrSH. [2004] the Iranian garden, ancient wisdom, novel landscape, Tehran, Tehran Museum of Contemporary Arts.
- [4] [2002]Great Islamic Encyclopedia. Publishing Organization of Ministry of Culture & Islamic Guidance.206.

- [19] Sad I. [2003] Therapeutic Effects of Garden. *Journal of Technology*. (38): 55-68.
- [20] Shahcheraghi, Azadeh. [2010] Campus Paradigms, an introduction to the review and recreating the Iranian garden 5th ed., [2015] Tehran: Academic Center of Education Culture and Research, Tehran Branch.
- [21] HeydarNattaj, Vahid. [2010] Iranian Garden (ancient wisdom, novel landscapes), Tehran, Tehran Museum of Contemporary Art.
- [22] Ja'afarnia S, Ghasemi M, Khosroshahi S. [2006] The Comprehensive and Pictorial Guide on the Medicinal Herbs Characteristics, Tehran, SokhanGostar.
- [23] Valizadeh H, MolavySh,Malekyrad A. [2010] Herbal Plans. Tehran: Nikemaleky.
- [24] Karimi H. [2007] The Iranian Developable Culture, Tehran, medical sciences publication.
- [25] Pirnia, Mohammad Karim. [1994] Iranian Garden, edited by FarhadAbuziya, *The Journal of Abadi*. 4(15):4-9.
- [26] Wilber, Donald Newton, Ackerman, Phyllis.[1940] The Persian Garden, The Iranian institute, Tehran.
- [27] Ansari M. [1999] The Iranian Garden Values (Safavid-Isfahan), PhD. Dissertation (unpublished), Tehran University, Fine Arts Department.
- [28] Masoudi A. [2003] The survey of the walls as one of the constituent elements in the Iranian garden, the seasonal journal of architecture and culture. (14): 100-104.
- [29] Falamaki, Mohammad Mansoor. [2004] The Iranian Garden Mysteries and Secrets, *the journal of museums*. (41):2-5.
- with decision tree learning. *Journal of Landscape and Urban Planning*. (73): 155-166.
- [9] Nikbakht A. [2004] Medicine in landscape architecture: Healing gardens. *Journal of Bagh-e-Nazar*. 1(2): 79-82.
- [10] Kaplan R, Kaplan S. [1989] The Experience of Nature: A Psychological Perspective. New York: Cambridge University Press.
- [11] Van den Berg A. et al. [2010] Green space as a buffer between stressful life events and health. *Journal of Social Science & Medicine*.(70): 1203-1210.
- [12] Johnson, James, Sydney Johnson, James, Links, Julian A.[1929] The Persian Garden, Illustrated by Julian A. Links,Windsor Press, England.
- [13] Bell S. [2007] The Landscapes Visual Designing Elements, translated by Mohammad Ahmadinejad, Khak Publication, Isfahan.
- [14] Khansari M.[1998] The Persian Garden: Echoes of Paradise, Mage Publishers, Washington DC.
- [15] Diba, Darab, Ansari, Mojtaba. [1995] The Iranian Garden, the collection of the first conference on historical architecture and Iranian urbanization, Tehran, Iranian Cultural Heritage Organization.
- [16] Shakeri, Maryam. [2003] Iranian Garden and Water, the moon of art book, seasonal journal of architecture and urbanization. 78-79.
- [17] Daneshdoost, Ya'ghub. [1990] The Iranian Garden (speeches in the Iranian national university, architecture department), *the seasonal journal of effect*. (18&19):218-221.
- [18] Mahmoodinejad, Hadi et al. [2009] The Garden Carpet: from carpeted heaven to the heaven carpets. The entrance carvings. (8): 107-124.

ARTICLE

EVALUATION OF AMINOGLYCOSIDES RESISTANCE GENES AMONG BETA LACTAMASEPRODUCING ESCHERICHIA COLI

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ABSTRACT

The aim of this study was to determine the occurrence of Aminoglycoside resistance in relation to extended-spectrum B-lactamase(ESBL)-producing *Escherichia coli* in Tabriz. *Escherichia coli* (*E. coli*) is a member of human and animals gut flora. It is also one of the major causes of nosocomial and other infections. Aminoglycosides are one of the antibiotics groups which are used for treatment of *E. coli* infections and yet resistance to aminoglycosides has increased in the recent years. ESBL-producing *E.coli* are specifically concerning because they confer resistance to a large number of antibiotics including third generation cephalosporin. The present study investigated the prevalence of genes encoding aminoglycoside-modifying enzymes in ESBL producing *E. coli* strains isolated from intestinal or extra-intestinal infections. Combined disk procedure was carried out for detection of beta lactamase production using ceftazidime and ceftazidime/clavulanic acid. The frequency of aminoglycoside modifying enzymes encoding genes *aac* (3)-IIa, *ant*(2')-Ia, *aph*(3')-IIa, *aph*(3')-Ia, and *aac*(3)-IV was analyzed by the PCR method. The results of this study indicated that the genes encoding aminoglycoside-modifying enzymes are prevalent in *E.coli* isolates in the study region, which highlighted the necessity of considering preventive measures to control dissemination of these resistance genes.

INTRODUCTION

Three major groups of *E. coli* are including commensal, intestinal pathogenic (diarrheagenic) and extra intestinal pathogenic (ExPEC) [1, 2]. Commensal *E. coli* can also be a causative agent of extraintestinal infection [3,4]. *E. coli* is the most common causative agent of disease in humans worldwide including the urinary tract, biliary tract, intravenous catheters, skin and soft tissue and wounds [5,6]. Each of these infections can lead to life-threatening septicemia, and *E. coli* are one of the main pathogens of nosocomial infections [7]. Appearing resistance in enterobacteriaceae is a crucial problem that requires immediate attention. The aminoglycosides and B- lactams are two immense families of antibiotics that are regularly used in clinical settings.

β-lactam antibiotics prevent bacteria through interruption of cell wall biosynthesis [8,9].

Resistance associated with production of extended-spectrum B- lactamases (ESBLs) is a specific problem in the handling of *E. coli* infections [10]. Infections with ESBL producing organisms are related to higher rates of mortality, morbidity and health care costs. ESBLs are most often plasmid mediated [11,12]. ESBL-producing *E.coli*, are not only specifically concerning because they confer resistance to a large number of antibiotics including third generation cephalosporins, but also their prevalence has been rising in community and hospital settings during recent years [13,14]. The aminoglycosides were first characterized in 1944, they act by binding to the 30S subunit of the prokaryotic ribosome resulting in interruption to protein synthesis. Resistance to aminoglycosides can be through decreased aminoglycoside uptake or enzymatic modification of the aminoglycoside through acetylation (AAC), adenylation (ANT) or phosphorylation (APH) 8. Since bacteria producing ESBL usually offers some resistance to other antibiotics and the genes of resistance are located on plasmids, it is believed that producing ESBLs are also related to resistance to aminoglycoside. The aim of this study was to determine the existence of aminoglycoside resistance genes in relation to ESBL producing strains.

MATERIALS AND METHODS

A total of one hundred seven (n=107) *E.coli* isolates (35 urines, 36 Diarrheal stools and 36 wounds) were collected from Emam Reza hospital (Tabriz, Iran) and were re-cultured and identified by biochemical tests in laboratory of microbiology department [15].

Antibacterial susceptibility tests of all isolated *E.coli* were performed by Kirby-Bauer disk diffusion method using following antibiotic disks (MAST Ltd UK) according to Clinical and Laboratory Standards Institute

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 lactamase

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(CLSI) instructions: amikacin(Ak 10µg), cefotaxime(CTX 30µg), ciprofloxacin(CIP5µg), ampicillin(AM 10µg), (SXT1.25/23.75µg), imipenem (IPM10µg), choleraamphenicol (C 30µg), kanamycin (K 10µg), ceftazidime (CAZ30µg), gentamicin (GM10µg), trimethoprim-sulphamethoxazol[16].

Detection of ESBL-producing *E.coli*

All resistant isolates to beta lactame antibiotics were cultured on Muller-Hinton agar (MH) and combined disk tests were performed by placing disks of ceftazidime (CAZ), and CAZ/Clavulanic acid (MAST Ltd UK) on MH plates. *ESBL* production was interpreted if the zones produced by the disks with clavulanate were \geq 5mm larger than those without inhibitor [17].

DNA extraction and PCR screening for anti-microbial resistance genes

CTAB protocol was used as DNA extraction method. DNA of all isolates confirmed for *ESBL* production and aminoglycoside resistance was extracted [18] and then aminoglycosides resistant genes were detected by PCR method utilizing the specific primers shown in [Table 1][19].

The PCR mixture (total volume, 20µl) included 1.5µl template DNA, 2µl of 10× PCR buffer plus MgCl₂, 0.4µl of Taq DNA polymerase, 0.4µl dNTP, 14.9µl H₂O and 0.4µl of each primer.

DNA amplification was carried out in a DNA thermal cycler (Gradient Eppendorf) by using the following conditions: Initial denaturation step at (94°C for 6 min), followed by 30 to 40 cycle repetitions of denaturation (94°C for 50 s), annealing (50-60 °C for 50s) and extension (72°C for 80s) with a final extension at 72°C for 8 min[20].

After electrophoresis of PCR products in 1.2% (w/v) of agarose for 70-80 min at 100v, gels stained with ethidium bromide (0.5 mg / ml) and images were taken by UV transillumination

RESULTS

Out of 107 isolates 27 were resistance to aminoglycoside (25.23%) and 72 were Beta-lactamase producing (67.29%). 18 of 27 aminoglycoside resistant *E.coli* produced Beta-lactamase (66.67%) by combined test[Fig. 1]. Bacterial isolates displayed the highest level of resistance to ampicillin (46.72 %) and trimethoprim-sulphamethoxazol (46.72%) and the lowest resistance to imipenem (0%) and amikacin (1.86%). The resistance features of 107 isolates of *E.coli* to the 10 antimicrobial disks examined is shown in [Table 2]. Prevalence of aminoglycoside resistance genes among 18 *ESBL* producing *E.coli* are as follows: ant(2'')-Ia 6 (%33.33), aph(3')-Ia 6 (%33.33), aac(3)-IIa 3 (%16.67), aph(3')-IIa 3 (%16.67), aac(3)-IV 0 (%0)[Fig.2].

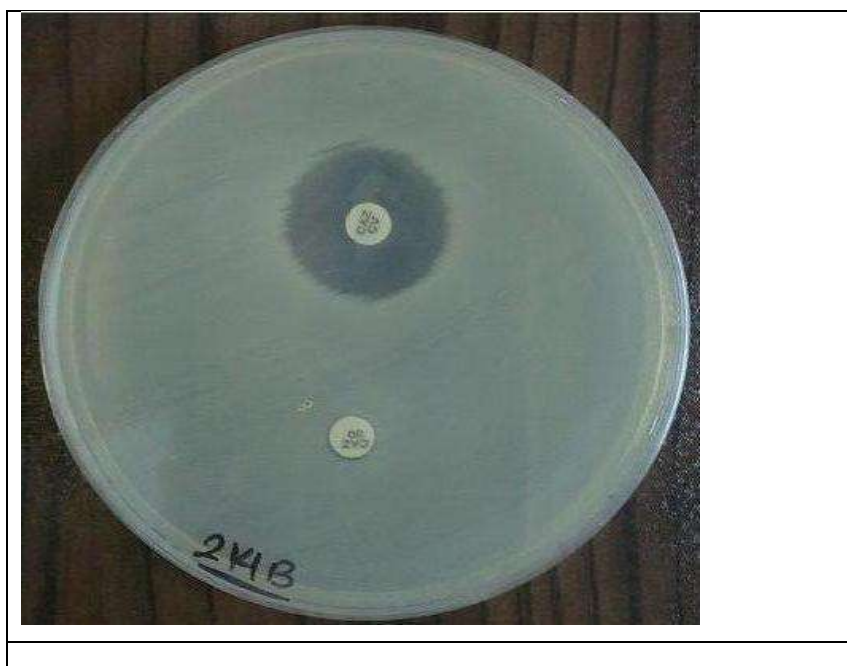


Fig. 1: Representative of *E. coli* isolate showing *ESBL* production confirmed by an increase in zone size of more than 5 mm for ceftazidime (CAZ) with and without clavulanic acid

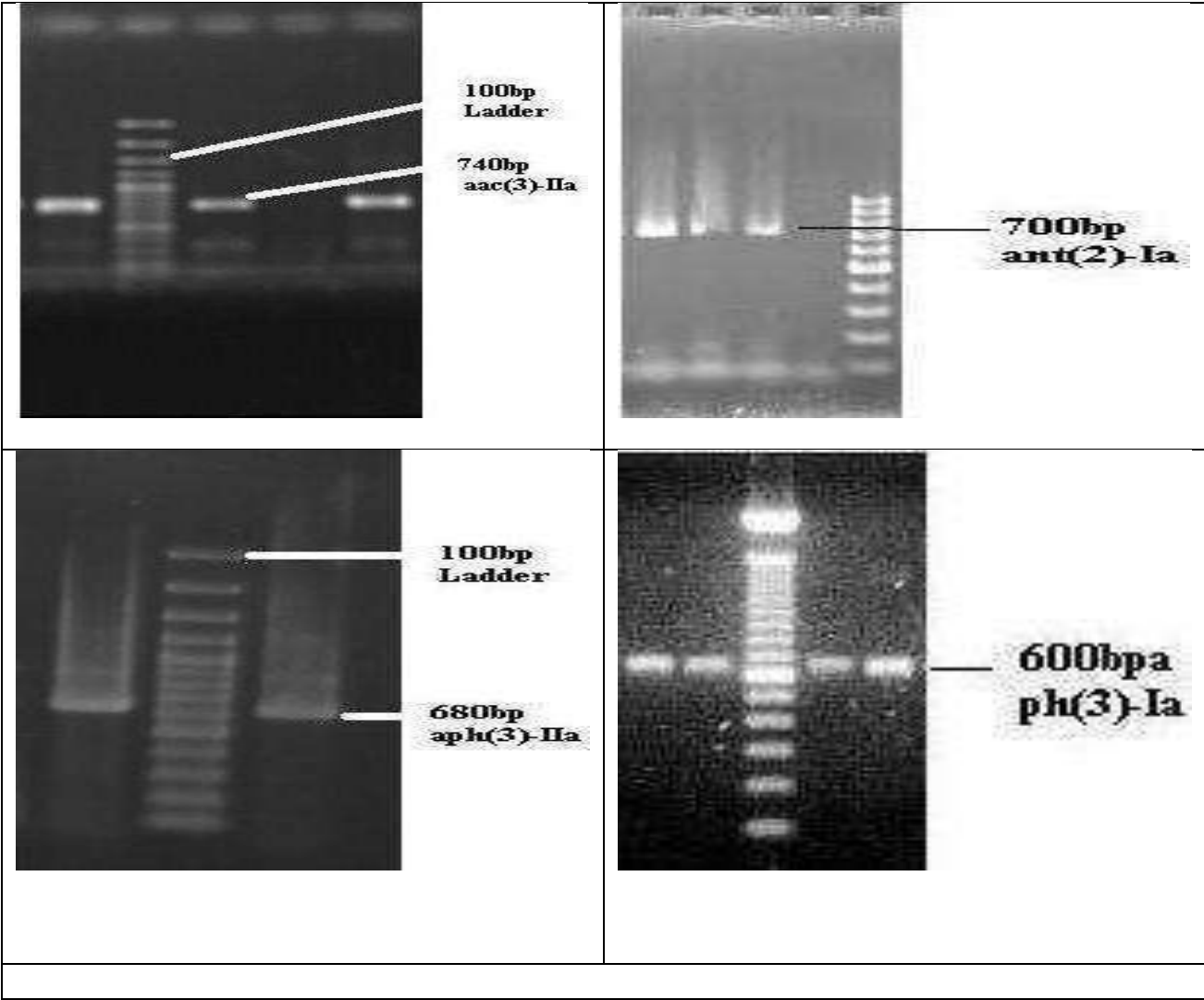


Fig 2: Agarose gel electrophoresis of PCR products from *E. coli* isolates tested for four aminoglycoside resistance genes: aac(3)-IIa (740 bp), ant(2'')-Ia (700bp), aph(3')-IIa (680 bp), aph(3')-I (600 bp). 100 bp Ladder was used in all PCR

Table 1: Primers used for the amplification of Aminoglycoside resistance genes among *E.coli* isolates

Target Gene	Primer Sequence	Annealing temperature	Cycle	Product size Bp	References
aac (3)-IIa	F: CGGAAGGCAATAACGGAG R: TCGAACAGGTAGCACTGAG	50	35	740	19
ant(2')-Ia	F: TCCAGAACCTTGACCGAAC R: GCAAGACCTCAACCTTTTCC	52	35	700	19
aph(3')-IIa	F: GAACAAGATGGATTGCACGC R: GCTCTTCAGCAATATCACGG	56	35	680	19
aph(3')-I	F: ATGGGCTCGCGATAATGTC R: CTCACCGAGGCAGTTCCAT	55	35	600	19
aac(3)-IV	F: GTGTGCTGCTGGTCCACAGC R:AGTTGACCCAGGGCTGTCGC	50	35	627	19

Table 2: Susceptibility of 107 *E.coli* isolated from different clinical specimens

Antibiotic	Resistance (No)	%
SXT1	50	46.72
AM	50	46.72
CIP	27	25.23

CTX	21	19.62
C	18	16.82
K	13	12.16
GM	12	11.21
CAZ	10	9.34
AK	2	1.86
IMP	0	0
GM; Gentamicin (10µg), K; Kanamycin(10µg), AK; Amikacin (10µg), IMP; Imipenem(10µg), C; Choleraamphenicol (30µg), CAZ; Cefazidime (30µg), SXT; Trimethoprim sulphamethoxazol (1.25/23.75µg), CIP; Ciprofloxacin(5µg), AM ;Ampicillin (10µg), CTX; Cefotaxime (30µg)		

DISCUSSION

In the last two decades, there has been increased resistance to β -lactam antibiotics due to plasmid mediated acquisition of *ESBLs* [21,22,23]. Aminoglycosides despite having side effects and problems associated with the increasing resistance of microorganisms to these drugs, as well as in the treatment of bacterial infections are most valuable [24]. Prevalence data collected from German in 2007, reported that the percentage of ciprofloxacin-resistant *E.coli* was (21.9%) compared to (25.23%) in our investigation [25,26]. In current study, the majority of isolates (46.72%) were resistant to ampicillin and trimethoprim-sulphamethoxazol that was higher than the results obtained from USA (39.1%) and Europe (29.8%) [27,28,29]. In this study low numbers of isolates were resistant to amikacin, ceftazidime and gentamicin (1.86%, 9.34% and 11.21% respectively) while the rate of resistance against these antibiotics in India (51%, 56% and 64% respectively) was much higher in compare with our results [Table 2][29].

Resistance to imipenem was not detected in either isolates, therefore imipenem is the choice of treatment of infections caused by *E.coli* isolates. We found a high rate of *ESBL* producing isolates (67.29%) compare to (13.5%) in nursing homes in Northern Ireland [30]. According to literature resistance against gentamicin, kanamycin and tobramycin is coded by *ant(2'')-Ia* gene [31], resistance to gentamicin is coded by *aac(3)-IIa* gene, and also concurrent *aph(3')-Ia* and *aph(3')-IIa* inactivated kanamycin and neomycin². The results of our study showed that *ant(2'')-Ia* (33.33%), *aac(3)-IIa* (16.67%), *aph(3')-Ia* (33.33%), *aph(3')-IIa* (16.67%) and *aac(3)-IV* (0%) were the most commonly detected aminoglycoside resistant genes in clinical isolates of *E.coli* by PCR. The results obtained in different regions are shown in [Table 3] indicates that there are a lot of variety in the percentage of genes from a region to another region in the world.

E. coli resistance to aminoglycosides is increasing over time, depending on situation of antibiotics consumption in the society, which requires further study. To prove the increasing prevalence of resistance to aminoglycosides, annually repeated surveillance is necessary [24,32,34]. Major differences in the findings related to antibiotic resistance, as well as the genes diversity of resistance to aminoglycosides indicate that important differences are due to diverse isolates and various geographic regions and most of aminoglycoside resistant *E. coli* are β -lactamase producer.

In conclusion, our results showed that Prevalence of the *aac(3)-IV* gene was lower than other studies and resistance by *aac(3)-IV* gene was not observed in this research. The high antibiotic resistance against all antibacterial disks examined were found except for imipenem and amikacin which prescription of this antibiotic can be effective for the treatment of *E.coli* infections of human in our area. Also high resistance against ampicillin and trimethoprim-sulphamethoxazol indicated that these antibiotics in the past were commonly used in our area.

Table 3: Showing the results obtained for aminoglycoside resistance genes in various geographic regions

Scientists	%	Genes	Year	References
Haldorsen and Simonsen	2.85	<i>Ant(2'')-I</i>	2014	35
Soleimani and Aganj	78.87	<i>Ant(2'')-I</i>	2014	31
Soleimani et al	47.88	<i>Ant(2'')-I</i>	2012	36
Soleimani and Aganj	47.88	<i>Aac(3)-IIa</i>	2014	31
Maynard and Bekal	33% in human, 17% in animal	<i>Aac(3)-IIa</i>	2004	2
Soleimani et al	54.83	<i>Aac(3)-IIa</i>	2012	36
Jakobsen et al	63.15	<i>Aac(3)-IIa</i>	2008	37
Jakobsen et al	0	<i>Ant(2'')-I</i>	2008	37
Maynard et al	75% in pigs	<i>Aac(3)-IV</i>	2003	19
Maynard and Bekal	50	<i>Aph(3')-I</i>	2004	2
Maynard and Bekal	0	<i>Aph(3')-IIa</i>	2004	2
Maynard and Bekal	0	<i>Ant(2'')-I</i>	2004	2
Saenz et al	17	<i>Aph(3')-I</i>	2004	38
Saenz et al	35.29	<i>Aph(3')-IIa</i>	2004	38
Vinue et al	66.67% (2 of 3)	<i>Aph(3')-I</i>	2008	39
Maynard et al	87	<i>Aph(3')-Ia</i>	2003	19

Maynard et al	15	Aph(3')-IIa	2003	19
Maynard et al	34	Aph(3')-I	2003	19
Maynard et al	8	Aph(3')-IIa	2003	19

CONFLICT OF INTEREST

There is no conflict of interest

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FINANCIAL DISCLOSURE

None

REFERENCES

1. Russo TA, Johnson JR. Proposal for a new inclusive designation for extraintestinal pathogenic isolates of *Escherichia coli*: ExPEC. (0022-1899 (Print)).
2. Maynard C, Bekal S, Sanschagrin F, et al. [2004] Heterogeneity among virulence and antimicrobial resistance gene profiles of extraintestinal *Escherichia coli* isolates of animal and human origin. *Journal of clinical microbiology*. 42(12):5444-52.
3. Tsukamoto N, Ohkoshi Y, Okubo T, et al. [2014] High Prevalence of Cross-Resistance to Aminoglycosides in Fluoroquinolone-Resistant *Escherichia coli* Clinical Isolates. *Chemotherapy*. 59(5):379-84.
4. Mandell G, Dolin R, Bennett J, et al. [2009] *Mandell, Douglas, and Bennett's principles and practice of infectious diseases*: Elsevier.
5. Zhang C, Xu X, Pu S, et al. [2014] Characterization of carbapenemases, extended spectrum β -lactamases, quinolone resistance and aminoglycoside resistance determinants in carbapenem-non-susceptible *Escherichia coli* from a teaching hospital in Chongqing, Southwest China. *Infection, Genetics and Evolution*. 27:271-76.
6. Cai JC, Zhang R, Hu YY, et al. [2014] Emergence of *Escherichia coli* sequence type 131 isolates producing KPC-2 carbapenemase in China. *Antimicrobial agents and chemotherapy*. 58(2):1146-52.
7. Jeong SH, Bae IK, Lee JH, et al. [2004] Molecular characterization of extended-spectrum beta-lactamases produced by clinical isolates of *Klebsiella pneumoniae* and *Escherichia coli* from a Korean nationwide survey. *Journal of clinical microbiology*. 42(7):2902-06.
8. Fouhy F, Ross RP, Fitzgerald GF, et al. [2014] A degenerate PCR-based strategy as a means of identifying homologues of aminoglycoside and beta-lactam resistance genes in the gut microbiota. *BMC microbiology*. 14(1):25.
9. Mingeot-Leclercq MP, Tulkens PM. [1999] Aminoglycosides: nephrotoxicity. *Antimicrobial agents and chemotherapy*. 43(5):1003-12.
10. Paterson DL. [2006] Resistance in gram-negative bacteria: Enterobacteriaceae. *The American journal of medicine*. 119(6):S20-S28.
11. Anago E, Ayi-Fanou L, Akpovi CD, et al. [2015] Antibiotic resistance and genotype of beta-lactamase producing *Escherichia coli* in nosocomial infections in Cotonou, Benin. *Ann Clin Microbiol Antimicrob*. 14(1):5.
12. de Been M, Lanza VF, de Toro M, et al. [2014] Dissemination of cephalosporin resistance genes between *Escherichia coli* strains from farm animals and humans by specific plasmid lineages. *PLoS genetics*. 10(12):e1004776.
13. Spadafino JT, Cohen B, Liu J, et al. [2014] Temporal trends and risk factors for extended-spectrum beta-lactamase-producing *Escherichia coli* in adults with catheter-associated urinary tract infections. *Antimicrobial resistance and infection control*. 3(1):599.
14. Zilberberg MD, Shorr AF. [2013] Secular trends in Gram-negative resistance among urinary tract infection hospitalizations in the United States. [2000–2009] *Infection Control*. 34(09):940-46.
15. Forbes BA, Sahm DF, Weissfeld AS, et al. [2002] *Diagnostic microbiology*. Bailey & Scott's Diagnostic Microbiology. 11(1):11-14.
16. Wikler MA. [2007] *Performance standards for antimicrobial susceptibility testing: Seventeenth informational supplement*: Clinical and Laboratory Standards Institute.
17. Tsakris A, Poulou A, Themeli-Digalaki K, et al. [2009] Use of boronic acid disk tests to detect extended-spectrum β -lactamases in clinical isolates of KPC carbapenemase-possessing Enterobacteriaceae. *Journal of clinical microbiology*. 47(11):3420-26.
18. Zou L, Meng J, McDermott PF, et al. [2014] Presence of disinfectant resistance genes in *Escherichia coli* isolated from retail meats in the USA. *Journal of Antimicrobial Chemotherapy*. 69(10):2644-49.
19. Maynard C, Fairbrother JM, Bekal S, et al. [2003] Antimicrobial resistance genes in enterotoxigenic *Escherichia coli* O149: K91 isolates obtained over a 23-year period from pigs. *Antimicrobial agents and chemotherapy*. 47(10):3214-21.
20. Sambrook J, Russell D. [2001] *Molecular Cloning: A Laboratory Manual*. Cold Spring Harbor Laboratory Press, Cold Spring Harbor, New York.
21. Kar D, Bandyopadhyay S, Bhattacharyya D, et al. [2015] Molecular and phylogenetic characterization of multidrug resistant extended spectrum beta-lactamase producing *Escherichia coli* isolated from poultry and cattle in Odisha, India. *Infection, Genetics and Evolution*. 29:82-90.
22. Ghatak S, Singha A, Sen A, et al. [2013] Detection of New Delhi Metallo-beta-Lactamase and Extended-Spectrum beta-Lactamase Genes in *Escherichia coli* Isolated from Mastitic Milk Samples. *Transboundary and emerging diseases*. 60(5):385-89.
23. Drieux L, Brossier F, Sougakoff W, et al. [2008] Phenotypic detection of extended-spectrum β -lactamase production in Enterobacteriaceae: review and bench guide. *Clinical Microbiology and Infection*. 14(s1):90-103.
24. Bellaaj A, Bollet C, Ben-Mahrez K. [2003] Characterization of the 3-N-aminoglycoside acetyltransferase gene aac (3)-IIa of a clinical isolate of *Escherichia coli*. *Annals of microbiology*. 53(2):211-18.
25. Meyer E, Schwab F, Schroeren-Boersch B, et al. [2001 to 2008] [2010] Research Dramatic increase of third-generation cephalosporin-resistant *E. coli* in German intensive care units: secular trends in antibiotic drug use and bacterial resistance.

27. Kresken M, Hafner D, Schmitz F, et al.[2001;2003] Resistenzsituation bei klinisch wichtigen Infektionserregern gegenüber Antibiotika in Deutschland und im mitteleuropäischen Raum. Bericht über die Ergebnisse einer multizentrischen Studie der Arbeitsgemeinschaft Empfindlichkeitsprüfungen & Resistenz der Paul-Ehrlich-Gesellschaft für Chemotherapie aus dem Jahre.
28. Vromen M, Van der Ven A, Knols A, et al. [1999] Antimicrobial resistance patterns in urinary isolates from nursing home residents. Fifteen years of data reviewed. *Journal of Antimicrobial Chemotherapy*.44(1):113-16.
29. Kahlmeter G. [2003] Prevalence and antimicrobial susceptibility of pathogens in uncomplicated cystitis in Europe. The ECO-SENS study. *International journal of antimicrobial agents*.22:49-52.
30. Akram M, Shahid M, Khan AU.[2007] Etiology and antibiotic resistance patterns of community-acquired urinary tract infections in JNMC Hospital Aligarh, India. *Annals of clinical microbiology and antimicrobials*. 6(1):4.
31. Rooney PJ, O'Leary MC, Loughrey AC, et al. [2009] Nursing homes as a reservoir of extended-spectrum β -lactamase (ESBL)-producing ciprofloxacin-resistant *Escherichia coli*. *Journal of Antimicrobial Chemotherapy*. 64(3):635-41.
32. Soleimani N, Aganj M, Ali L, et al. [2014] Frequency distribution of genes encoding aminoglycoside modifying enzymes in uropathogenic *E. coli* isolated from Iranian hospital. *BMC research notes*.7(1):842.
33. Vanhoof R, Nyssen H, Van Bossuyt E, et al. [1999] Aminoglycoside resistance in Gram-negative blood isolates from various hospitals in Belgium and the Grand Duchy of Luxembourg. *Journal of Antimicrobial Chemotherapy*.44(4):483-88.
34. Kong H, Li X, Wang J, et al. [2006] Evaluation of aminoglycoside resistance phenotypes and genotyping of acetyltransferase in *Escherichia coli*. *Zhejiang da xue xue bao Yi xue ban= Journal of Zhejiang University Medical sciences*.35(1):83-86.
35. Ho P-L, Wong RC, Lo SW, et al. [2010] Genetic identity of aminoglycoside-resistance genes in *Escherichia coli* isolates from human and animal sources. *Journal of medical microbiology*. 59(6):702-07.
36. Haldorsen BC, Simonsen GS, Sundsfjord A, et al. [2014] Increased prevalence of aminoglycoside resistance in clinical isolates of *Escherichia coli* and *Klebsiella* spp. in Norway is associated with the acquisition of AAC (3)-II and AAC (6')-Ib. *Diagnostic microbiology and infectious disease*.78(1):66-69.
37. Soleimani N, Sattari M, Brumand MA, et al. [2012] Evaluation Spread of Ant (2'')-Ia Gene in Aminoglycoside Resistant *Escherichia Coli* Isolated from Urine by PCR.
38. Jakobsen L, Sandvang D, Hansen LH, et al. [2008] Characterisation, dissemination and persistence of gentamicin resistant *Escherichia coli* from a Danish university hospital to the waste water environment. *Environment international*. 34(1):108-15.
39. Sáenz Y, Briñas L, Domínguez E, et al. [2004] Mechanisms of resistance in multiple-antibiotic-resistant *Escherichia coli* strains of human, animal, and food origins. *Antimicrobial agents and chemotherapy*. 48(10):3996-4001.
40. Vinué L, Sáenz Y, Somalo S, et al. [2008] Prevalence and diversity of integrons and associated resistance genes in faecal *Escherichia coli* isolates of healthy humans in Spain. *Journal of antimicrobial chemotherapy*. 62(5):934-37.

ARTICLE

ASSESSING AND COMPARING PLAYERS POSITIONS MENTAL SKILLS OF IRAN MEN'S NATIONAL JUNIOR VOLLEYBALL TEAM

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ABSTRACT

History and objectives: Mental skills are important aspects of successful sport performance in all sport competitions. This study was designed to assess and compare players' positions mental skills of Iran men's national junior volleyball team in year 2015.

Materials and methods: This cross sectional research includes 16 Iran men's national junior volleyball team players invited to the preparation training in year 2015. Mental skills as well as demographic data of the players was assessed by OMSAT-3 questioner and a personal data form. SPSS: PC 16.0 software and One-way ANOVA was employed to analyze the data. **Results: Conclusion and Discussion:** The result of this study showed that mental skill is an important aspect of sport performance and may play a role in protecting the athletes against sport injury. Further research is needed to determine the effect of mental skill training on decreasing the incidents of sport injuries.

INTRODUCTION

The importance of physical preparation for successful sport performance is a well-known fact and all the coaches and trainers employ all the available sources to assure that their athletes are physically prepared for competitions. However, with the many research findings and successful sport performance analysis of elite athletes reports, nowadays all the researchers and practitioners in the field of athlete preparation for successful sport performance in major sport competitions and different sport fields agree that physical skills and physical fitness alone are not adequate to assure highly successful performances unless the athletes are equally mentally prepared to take part in their important sport contest. The significance of mental skills and preparation led to the development of sport psychology and ever since the field has been established, attempt to study and prepare the athletes mentally have been underway and numerous researches have been conducted to assess the mental skills of athletes in various level and different contests in different countries [1, 2]. For that reason, psychological preparation of athletes became a part of athletic trainings in many sport field and sport coaches and trainers use mental preparation for the successful performance and competition [3, 4]. For assessment of mental skills of athletes, various approaches and tools have been developed. Following many years of research and development in this subject, Ottawa Mental Skills Assessment Tool-3 was introduced by Durand-Bush and Salmela [2001] named the Ottawa Mental Skills Assessment Tool-3 (OMSAT-3) to measure a broad range of mental skills important for sport performance. Mental skill assessment has become an important field of research for nearly all aspects of sport competitions including students' Olympiads [5]. Mental skills are procedure that helps athletes control their minds efficiently and consistently as they execute sport - related goals. Psychological skills techniques help athletes adjust their action, thoughts, feeling and physical sensation that will improve their games. Since OMSAT-3 was introduced, the tool had been used in many countries for many sport fields. The instrument validity and reliability has been established and used in Iran as well as other countries [6,7,8,9,1]. Individual sport and team sport athletes need to learn mental skills and make the training part of their sport preparation for competing in sport contests. While individual sport may require competing against other athletes, in team sports there are different positions that may require different mental preparation and training. In this regard, Najah and associates [2016] conducted a research to compare the mental skill level of young soccer players and concluded that there was a significant difference between the mental skill level of different positions. Guelmami and associates [2014] conducted a research involving different sports and concluded that psychological skills distinguished between more and less successful talented athletes.

However, other studies reported that there were no significant differences between different position specific play in soccer and various psychological attributes [10,11]. This study was designed to determine the mental skill level of volleyball players in junior level of Iran in year [2015].

MATERIALS AND METHODS

Ottawa-Mental Skill-3 was employed to compare the mental skill level of volleyball players in junior national league of Iran in year [2015].

This tool has been used extensively and is validated for measuring mental skills of Iranian athlete [8]. The instrument measures 12 sub-skills within three components divided into basic including Goal Setting, Self Confidence, Commitment, psychosomatic including Stress Reactions, relaxation, Fear Control, Activation and cognitive component such as Relaxation, Imagery, Mental Practice, Focusing, Refocusing and Competition Planning rated on 6-point Likert scale answered as "strongly disagree" to "strongly agree"

KEY WORDS

Mental Skills, Volleyball,
Junior Team

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The OMSAT-3's scales have demonstrated acceptable internal consistency ($\alpha = .68$ to $.88$, mean $.78$) and temporal stability ($r = .78$ to $.96$, mean $.86$; [12]). The data were collected at the competition sites during the games. All the players invited to national junior team including 16 players participated in this research. Every player individually was asked to complete the OMSAT-3 form. Every form was collected in the same session. Statistical analysis including independent t-test was performed on data by using SPSS:PC 16.0 software.

RESULTS

Kolmogorov-Smirnov test result indicated that the subscales of OMSAT-3 had normal distribution ($P > 0.05$); therefore, parametric statistical test was employed to analyze the data. Descriptive statistics including mean and standard deviations of positions and fundamental, psychosomatic and cognitive skills of men's national junior volleyball players based on position is presented in [Table 1]

Table 1: Means \pm standard deviations of the OMSAT-3 sub-scale scores of men's national junior volleyball players based on position

Skills	positions	N	Mean	Std. Deviation
Fundamental	Set	3	6.4722	.64729
	Power spiker	7	6.2143	.83729
	Behind the line	2	6.2083	.64818
	Libero	2	6.2083	1.00173
	Speed spiker	2	5.2083	.05893
Psychosomatic	Set	3	4.1875	.38017
	Power spiker	7	4.3304	.42192
	Behind the line	2	3.9375	.17678
	Libero	2	5.0000	.44194
	Speed spiker	2	4.9375	.00000
Cognitive	Set	3	4.2167	.33292
	Power spiker	7	4.4357	.50143
	Behind the line	2	4.7750	.03536
	Libero	2	5.2500	.42426
	Speed spiker	2	5.1500	.28284

The result of One-Way ANOVA indicated that there were no significant differences among the means of fundamental, psychosomatic and cognitive skills of men's *national junior volleyball* players Iran in year 2015. These results are presented in [Table 2].

Table 2: One- Way ANOVA comparing the means of fundamental, psychosomatic and cognitive skills of different positions of men's national junior volleyball players

Skills	Sources of Variation	Sum of Squares	df	Mean Square	F	Sig.
Fundamental	Between Groups	2.124	4	.531	.903	.495
	Within Groups	6.471	11	.588		
	Total	8.595	15			
Psychosomatic	Between Groups	1.892	4	.473	3.285	.053
	Within Groups	1.584	11	.144		
	Total	3.476	15			
Cognitive	Between Groups	2.128	4	.532	2.939	.070
	Within Groups	1.991	11	.181		
	Total	4.120	15			

Further analysis was performed on sub scales of fundamental, psychosomatic, and cognitive skills of OMSAT-3 for different positions of Volleyball players separately. The result of analysis indicated that there was no significant differences between the fundamental sub scales of goal-setting ($p = 0.586$), confidence ($p = 0.582$), and commitment ($p = 0.584$) of different position of the junior national volleyball players. These results are presented in [Table 3].

Similar analysis was performed on sub scales of psychosomatic skills of different positions of Volleyball players separately. The result of analysis indicated that there was no significant differences between the psychosomatic sub scales of stress reaction ($p = 0.244$), relaxation ($p = 0.763$), fear control ($p = 0.061$) and activation ($p = 0.860$) of different position of the junior national volleyball players. These results are presented in [Table 4].

Table 3: One- Way ANOVA comparing the means of fundamental sub scales of goal-setting, confidence and commitment of men's national junior volleyball players

Sub-scales	Sources of Variation	Sum of Squares	df	Mean Square	F	Sig.
goal	Between Groups	2.120	4	.530	.737	.586
	Within Groups	7.908	11	.719		
	Total	10.027	15			
confid	Between Groups	1.902	4	.476	.744	.582
	Within Groups	7.031	11	.639		
	Total	8.934	15			
commitment	Between Groups	2.768	4	.692	.739	.584
	Within Groups	10.295	11	.936		
	Total	13.062	15			

Table 4: One- Way ANOVA comparing the means of psychosomatic sub scales of stress reaction, fear control, relaxation and activation of the junior national volleyball players

Sub-scales	Sources of Variation	Sum of Squares	df	Mean Square	F	Sig.
stress reaction	Between Groups	7.549	4	1.887	1.595	.244
	Within Groups	13.013	11	1.183		
	Total	20.562	15			
relaxation	Between Groups	2.494	4	.624	.461	.763
	Within Groups	14.881	11	1.353		
	Total	17.375	15			
fear control	Between Groups	7.400	4	1.850	3.113	.061
	Within Groups	6.537	11	.594		
	Total	13.938	15			
activation	Between Groups	.931	4	.233	.318	.860
	Within Groups	8.054	11	.732		
	Total	8.984	15			

Additional analysis showed that there was not a significant differences among the sub scales of cognitive skills of different positions of Volleyball players in imagery ($p=0.876$), mental practice ($p=0.822$), and competition plan ($p=0.906$) of the junior national volleyball players separately. However, the result showed that there was a significant difference among the means of focusing (0.048) and refocusing (0.002) of different positions. These results are presented in [Table 4].

Table 5: One- Way ANOVA comparing the means of cognitive sub scales of focusing, refocusing, imagery, mental practice and competition plan of the junior national volleyball players

Sub-scales	Sources of variations	Sum of Squares	df	Mean Square	F	Sig.
focusing	Between Groups	10.295	4	2.574	3.405	.048
	Within Groups	8.314	11	.756		
	Total	18.609	15			
refocusing	Between Groups	21.751	4	5.438	8.512	.002
	Within Groups	7.027	11	.639		
	Total	28.777	15			
imagery	Between Groups	.338	4	.084	.294	.876
	Within Groups	3.162	11	.287		
	Total	3.500	15			
Mental practice	Between Groups	1.463	4	.366	.375	.822
	Within Groups	10.720	11	.975		
	Total	12.184	15			
Competition plan	Between Groups	1.298	4	.325	.246	.906
	Within Groups	14.510	11	1.319		
	Total	15.809	15			

Therefore, LSD post hoc method of comparison among the means focusing and refocusing players was employed to locate the differences. The result showed that there was significant differences among the setters and other positions ($p < 0.05$) in focusing and between the liberoes – setter and the other positions ($p < 0.05$). The setters scored significantly higher than the other positions in focusing and the setters as well as the liberoes scored significantly higher than the other positions in refocusing.

DISCUSSION

The purpose of this research was to compare the mental skills of junior national volleyball players in different positions. For this purpose, OMSAT-3 that is commonly used for this type of research was employed. The instrument has been extensively used in the literature and has been validated in Iran [8] includes three important components of mental skill including the basic, psychosomatic and cognitive skills of athletes. the basic component includes Goal Setting, Self Confidence, Commitment, psychosomatic includes Stress Reactions, Relaxation, Fear Control, Activation and in cognitive component there are the subskills of Imagery, Mental Practice, Focusing, Refocusing and Competition Planning. The game of volleyball is a relatively popular game in Iran and recently successful performance of the Iranian teams in international sport competition at various age groups has been achieved. The game includes three categories of players including attackers (spikers), receivers, basically the libero and the setter that must set the ball for the attackers. The result of analysis of the main components of mental skills of different positions of players, that is, the basic, psychosomatic and cognitive skills of junior volleyball players who were invited to national team camp, there was no significant differences across the positions of players ($p > 0.05$). In this regard, the findings were not similar to what was reported earlier by Najah and Rejab (2015) who investigated selected psychological skills of male youth soccer players in different playing positions. In their study, different positions of youth Tunisian soccer players between the ages of 15 to 19 years old from different clubs of 1st and 3rd Youth Class divisions were compared. The difference in findings of that research with the present research findings may be attributed to the difference in the game since soccer players have more players in a team and more positions. In addition, the players were selected from different classes. The present research included volleyball game positions which is different than soccer and included national players invited to the preparation camp that place a restriction on the number of participants in the research. Usually 16 players are the last stage players that finally 4 of them with negligible skill ability are eliminate from the final list. However, when the subskills of every component were analyzed, there was a significant difference between the mental subskills of different positions in focusing and refocusing ($p = 0.04$, 0.002) Post hoc test result showed that there was a significant differences between the setters and other positions ($p < 0.05$) in focusing. In addition, a significant differences was found between the liberoes – setter and the other positions ($p < 0.05$) in refocusing. The higher scores setters and liberoes in mental sub skills of focusing and refocusing is an indication of the significance of this two skills. The setters need to be focused at all times since they are the mastermind of the game and if they are focused on their own team players position and the opponents as well, they can successfully set a pass that the attackers in their team easily score while take advantage of the poor position of the opponents on the net as well as on the court. Thus the success of a setter depend on not only on a good pass but also on how he set the ball for the attacker who is in the best position to spike. This process of information that has to take place in a fraction of second requires full attention to all the possible events taking place in the own team as well as the opponent team's court. In a cross-sectional survey design using Bull's Mental Skills Questionnaire and the Athletic Coping Skills Inventory-28 (ACSI-28), a insignificant differences between the subscale scores of the players in different playing positions, it was concluded that no psychological skill differences was present among players in different playing positions [10]. This finding is relatively similar to the finding of the present research except the focusing and refocusing subskills. The difference in these variables may be attributed to the difference in task demands of volleyball versus soccer. Volleyball is played in a smaller court compared to soccer that is played in a large field. Loss of focusing or ability to refocus in soccer may not matter as much as it matters on volleyball where poor focusing in the game may cost a point in every service whereas such may not be the case for many positions in the soccer game.

In summary, despite the fact that there was no significant difference among the three main components of mental skills of the junior national volleyball players, the mean scores of the component particularly the psychosomatic component ranged between 4. To 5. Based on the scoring values for every subskill, the highest value score is 7. Thus, there is a need for the players to improve their mental skills by learning the methods of training to become more proficient in these sub skills. The players were relatively more efficient in basic components and scored higher in every subskill. It may be concluded that the basic subskills of commitment, goal-setting and self-confidence improve through many years of training and competitions without particular training interventions. The players who are invited to national team may have gained these subskills after several years of practice and competition experiences. Goal setting have a significant effect on performance by directing the attention and actions of an individual or group; mobilizes effort, increases persistence in addition to causing motivation increase to search for appropriate performance. Goal setting theory was initially developed by Locke and Latham (1994) in organizational psychology, and was used to describe achievement behaviors in industry. Goal setting is one of the most

effective psychological strategies for improving performance and motivation in organizational settings . Self-confidence is another important subscale of mental skill. Self-efficacy is a specific self-perception, and has been referred to as a situational specific form of self-confidence [13]. and the inverse relationship with anxiety has been reported [14]. Bandura [1997] argued that efficacy expectations to perform a given task could influence self-perceptions (e.g., self-confidence) when the success/is heavily dependent on self-worth. It needs to be mentioned that the scope of this research was limited to junior volleyball players invited to the national camp training. Larger scale research with the junior league of volleyball players is needed to make more comprehensive conclusions.

CONCLUSION

The result of this research showed that there were no significant differences among the three main components of sport mental skill measured by OMSAT-3 between the junior national volleyball players of different position in year [2015]. However, there were significant differences between the focusing and refocusing skills of setters and liberoes compared to other position. Based on the result of this research, all players participating in competitive volleyball need higher level of mental skills. More research is needed to assess the mental skills of girls counter parts as well as players at junior level.

CONFLICT OF INTEREST

There is no conflict of interest

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FINANCIAL DISCLOSURE

None

REFERENCES

- [1] Salmela JH, Monfared SS, Mosayebi F, Durand-Bush N. [2009]. Mental Skill Profiles and Expertise Levels of Elite Iranian Athletes. *International Journal of Sport Psychology*. 40: 361-373.
- [2] Taylor J, Wilson G. [2005] Applying Sport Psychology: Four Perspectives. Champaign, IL: Human Kinetics
- [3] Eloff M, Monyeki MA, Grobbelaar HW. [2011] A survey of mental skills training amongst South African field hockey players at tertiary institutions. *African Journal for Physical, health, Education, Recreation and Dance*. 17 (1).
- [4] Ghasemi A, Yaghoubian A, Momeni M. [2012] Mental Toughness and Success Levels among Elite Fencers. *Advances in Environmental Biology*. 6:2536-2540.
- [5] Bahmani, SaeidSoukhtehzari, AliMazaherinezhad, Mansour Sayyah, [2015] Assessing Mental Skills of Student Athletes in a Colligate Sport Olympiad, *Biosciences Biotechnology Research Asia*. 12(Spl. Edn. 2)
- [6] Bahmani, SaeidSoukhtehzari, AliMazaherinezhad, Mansour Sayyah. [2015] Assessing Mental Skills of Student Athletes in a Colligate Sport Olympiad, *Biosciences Biotechnology Research Asia*, 12(2).
- [7] Shilpi Jain, Wazir Singh Phogat, Kumar Pardeep, Interactive effect of mental skills training and anxiety on Indian athlete's performance, Interactive effect of mental skills training and anxiety on Indian athlete's performance *International Journal of*
- [8] Vaezmousavi MK, Samandar Gh. [2001] Mental skills norms for male athletes, *Harakat, Journal of the faculty of physical education and sport science*. 9.
- [9] Craciun M, Dobosi S, Loan N, Prodea C. [2008] Confirmatory Factor Analysis of the Ottawa Mental Skill Assessment Tool (OMSAT-3*)-Romanian Version. *Human Movement*. 12: 159-164.
- [10] Jooste J, Steyn BJM, Vandenberg L. [2014] Psychological Skills, Playing Positions and Performance of African Youth Soccer Teams. *South African Journal for Research in Sport, Physical Education and Recreation*. 36: 85-100.
- [11] Kurt C, Catikkas F, murlu IK, Atalag O. [2012] Comparison of Loneliness, Trait Anger-Anger Expression Style, Self-Esteem Attributes with Different Playing Position in Soccer. *Journal of Physical Education and Sport*. 12:39-43.
- [12] Durand-Bush N, Salmela JH, Green-Demers I. [2001] The Ottawa Mental Skills Assessment Tool (OMSAT-3). *Sport Psychologist*. 15:1-19.
- [13] Feltz DL. [1988] Self-confidence and sports performance. In Pandolf KB (Ed.) *Exercise and Sport Sciences Reviews*. New York: MacMillan. 423-457.
- [14] Martens R, Vealey RS, Burton D. [1990] Competitive anxiety in sport. Champaign. IL: Human Kinetics.
- [15] Bandura A. [1997] Self-efficacy: The exercise of control. New York: Freeman.
- [16] Bandura A. [1977] Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review* 84:191-215.
- [17] Bueno J, Weinberg RS, Fernández-Castro J, Capdevila L. [2008] Emotional and motivational mechanisms mediating the influence of goal setting on endurance athletes' performance. *J Sport Exerc Psychol*. 9:786-799. PMID: PMC3588684.
- [18] Franks AM, Williams AM, Reilly T, Nevill A. [1999] Talent identification in elite youth soccer players: physical and physiological characteristics. *J. Sports Sci*. 17:812.
- [19] Gould D, Dieffenbach K, Moffett A. [2002] Psychological characteristics and their development in Olympic c champions. *J. Appl. Sport Psychol*. 14:172-204.
- [20] Guelmami Noömen, Jabri Mohamed, Houssein Nasri, Agrebi Brahim. [2015] Sensitivity, Internal Consistency and Factorial Structure of the Arabic Version of OMSAT-3, *Advances in Physical Education*. 5: 18-25
- [21] Guelmami N, Hamrouni S, Agrébi B. [2014] Psychological profiles of talented male youth athletes in team sports games. *Journal of Physical Education and Sports Management*. 5(1):5-10

- [22] Jia Y, Dong XJ.[2006] Goal setting in physical teaching. Shandong Sport Sci Tech. 28:78–79.
- [23] Locke, Edwin A, Shaw, Karyll N, Saari, Lise M, Latham, Gary P. [1981] Psychological Bulletin. 90(1):125-152.
- [24] Malina RM, Pena Reyes ME, Eisenmann JC, Horta L, Rodrigues J, Miller R. [2000] Height, mass and skeletal maturity of elite Portuguese soccer players aged 11-16 years. J. Sports Sci. 18:685-693.
- [25] Ievleva L, Orlick T. [1991] Mental links to enhance healing. The Sport Psychologist. 5: 25-40.
- [26] Morris T. [2000] Psychological characteristics and talent identification in soccer. J. Sports Sci. 18: 715-726.
- [27] Najah A, Rejeb RB. [2015] The Psychological Profile of Youth Male Soccer Players in Different Playing Positions. Advances in Physical Education. 5:161-169. <http://dx.doi.org/10.4236/ape.2015.53020>
- [28] Rushall BS, Shewchuk ML. [1989] Effects of thought content instructions on swimming performance. *The Journal of Sports Medicine and Physical Fitness*. 29: 326-334.
- [29] Sayyah M, Rahimi SM, Bigdeli M, Rajabi M. [2011] Comparing the Anthropometric Characteristics of Injured and Non-Injured Girl Student Athletes Participating in the Sport Olympiads Held by the Ministry of Health and Medical Education in the Summer of [2009] in the City of Yazd, Biosciences, Biotechnology Research Asia.(2): 367-372
- [30] Schinke RJ, da Costa J, Andrews M. [2001] Considerations regarding graduate student persistence. The Alberta Journal of Educational Research. 19 (4): 341-352.
- [31] Weina L, Chenglin Z, Liu J, Watson JC. [2012] The Effect of Goal Setting Difficulty on Serving Success in Table Tennis and the Mediating Mechanism of Self-regulation J Hum Kinet. 33: 173–185. PMID: PMC3588684
- [32] White, Sally A. [2006] Psychological skills: Differences between volleyball players on the youth national team and those involved in the 14s high performance camp, email: swhite@ilstu.edu.
- [33] Williams JM, Krane V. [2001] Psychological characteristics of peak performance. In: Williams JM (Ed), Applied Sport psychology: Personal growth to peak performance. Mountain View, CA: Mayfield. 4:137-147.

ARTICLE

EFFECT OF SALICYLIC ACID PRETREATMENT ON SEED GERMINATION OF 16 DIFFERENT ORNAMENTAL LANDSCAPE ANNUALS UNDER DROUGHT STRESS

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ABSTRACT

Water deficit is one of the most important problems in arid and semi- arid regions. In drought condition, using some plant growth regulators such as salicylic acid might be an effective strategy to prevent destructive effect of drought and provide plant compatibility. In this investigation, seeds of 16 ornamental annuals (*Zinnia elegans* 'Lilliput rose', *Ageratum houstonianum* 'Blue Danube', *Catharanthus roseus* 'Bright Eye', *Catharanthus roseus* 'Carmine', *Petunia hybrida* Red, *Petunia hybrid*, *Celosia plumose*, *Gomphrena gnome* 'Pink', *Gomphrena gnome* 'Purple' (Buddy), *Gomphrena gnome* 'White', *Callistephus chinensis* 'Milady Mix', *Tagetes patula* 'Hero Harmony', *Tagetes erecta* 'Discovery Yellow', *Calendula officinalis*, *Sanvitalia procumbens* and *Pennisetum glaucum* 'Purple Majesty') were chosen for study. The experimental was conducted as a factorial using a completely randomized design (CRD) with 3 replications. Drought stress at 2 levels (-0.33 and -3.75 bar) was imposed using polyethylene glycol (PEG 6000) and SA at (0 and 1 mM) was also prepared. Germination percentage, germination rate, root and shoot length, shoot fresh and dry weight were measured at the experiment. There were significant differences between germination ability both in percent and rate among 16 species and stress levels ($p < 0.01$). SA showed no noticeable effect as not considered. Except for shoot fresh and dry weight interaction effects of species \times stress for all studied traits were significant ($p < 0.01$). Germination percent reduction was most recognized in *Callistephus chinensis* 'Milady Mix', *Gomphrena gnome* 'White', *Catharanthus roseus* 'Bright Eye' with 78.75%, 72.38% and 48.27% reduction respectively compared to control. Overall it was obvious that germination abilities in this experiment can be pointed to species characteristics itself and secondly to drought stress.

INTRODUCTION

KEY WORDS
Landscape features,
environmental stress,
water limitation,
aesthetic quality

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Drought is one of the major physical parameter of an environment, which determines the success or failure of plants establishment [1]. Drought is the most important limiting factor for crop production and it is becoming an increasingly severe problem in many regions of the world [2]. Stages of seed germination and seedling emergence are critical stages for plant establishment in crops grown in arid and semi-arid regions. It is at these critical stages that crop stand density and final yield are determined [3]. It has been reported that water stress can reduce or delay germination or completely prevent germination [4]. Drought inhibited germination and seedling growth in okra (*Hibiscus esculentus* L.) [5]. Drought decrease germination and seedling growth, and these are one important case to produce crops [1]. The studies that have been conducted show that the factor of origin is also an important factor that determines the tolerance for drought stress in addition to the species [6]. Drought tolerance screening related to Polyethylene (PEG) induced water stress has successfully been performed in many agricultural plant species such as *Matricaria chamomilla* [7], Soybean [8], *Helianthus annuus* [9], *Triticum aestivum* [10]. Plants produce proteins to react biotic and abiotic stresses. These proteins were induced by some phytohormones such as salicylic acid (SA) and Ascorbic acid (As) [11]. These compounds can decrease drought effects in plants under stress. SA has been found to play a key role in the regulation of plant growth, development and in responses to environmental stresses [12]. Further, its role is evident in ion uptake and transport photosynthetic rate, stomatal conductance and transpiration [13]. Several methods of SA application (seeds soaking prior to sowing, adding to the hydroponic solution, irrigating or spraying with SA solution) have been shown to protect various plant species against abiotic stress by inducing a wide range of processes involved in stress tolerance mechanisms [14]. At sowing time, water shortage lead to irregular seed germination and unsuccessful seedling growth, which have negative effects on the yield [15,16]. Seed germination is the most sensitive stage to abiotic stress [17,18,19]. It has been reported that water stress can reduce or delay germination or completely prevent germination [4]. Effects of drought stress reported that emergence was the most and germination was the least affected. Because

of water limitations and the importance of using hardy plants for near future, planning a research for such plants seems to be necessary.

The aim of this study were to identify the impact of drought stress and salicylic acid pretreatment on germination response of 16 ornamental annuals common in landscape .

MATERIALS AND METHODS

Experimental conditions and treatments

This study was conducted in the laboratory of the Department of horticultural Science and Landscape, Ferdowsi University of Mashhad, Iran during 2014. In this investigation, seeds of 16 ornamental annuals (*Zinnia elegans* 'Lilliput rose', *Ageratum houstonianum* 'Blue Danube', *Catharanthus roseus* 'BrightEye', *Catharanthus roseus* 'Carmine', *Petunia hybrida* Red, *Petunia hybrid*, *Celosia plumose*, *Gomphrena gnome* 'Pink', *Gomphrena gnome* 'Purple' (Buddy), *Gomphrena gnome* 'White', *Callistephus chinensis* 'Milady Mix', *Tagetispatula* 'Hero Harmony', *Tagetserecta* 'Discovery Yellow', *Calendula officinalis*, *Sanvitaliaproculumbens* and *Pennisetum glaucum* 'Purple Majesty') were chosen for study. The experiment was conducted as a 2x2 factorial based on a completely randomized design (CRD) with 3 replications. Drought stress at 2 levels (-0.33 and -3.75 bar) was imposed using polyethylene glycol (PEG 6000) and SA at (0 and 1 mM) was also treated as alleviator. Seeds were surface sterilized using 3% sodium hypochlorite solution for 60 second and then rinsed three times with sterile distilled water. The first group of the seeds was soaked in distilled water while the second group was soaked in 1Mm salicylic acid for 12 hours. After soaking period the seeds were air dried. Germination test was conducted by three replications of 25 seeds from every treatment in 9 cm petri dishes.

The water potential of the germination substrates (-0.33 and -3.75 bars) was determined using PEG-6000 solution, prepared as described by Michel and Kaufmann (1993) the following formula was used:

$$\psi_s = -(1/018 \times 10^{-2})C - (1/18 \times 10^{-4})C^2 + (2/67 \times 10^{-4})CT + (8/39 \times 10^{-7})C^2T$$

where ψ_s is osmotic pressure in terms of bar, C is the concentration of PEG- 6000 in g/kg H₂O and T is the temperature in degrees celsius.

The experiment was conducted in a germination chamber at 25±3°C and daily observations were recorded for 10 days. Germination percentage (GP), germination rate (GR) (seeds day⁻¹), root and shoot length (cm), shoot fresh and dry weight (mg plant⁻¹) were finally measured at the end of the experiment. Seeds were considered to have germinated when radical had emerged and elongated by at least 2 mm [20]. Dry weights were measured after drying shoots at 80° C for 48 hours in an air oven.

Germination percent and Germination rate

The germinating seeds were counted at regular intervals. The germination percentage was calculated as follows:

$$\text{Germination Percentage} = n/N \times 100$$

Where n is the number of germinated seeds, and N is the total number of seeds [21].

Rate of germination (seeds day⁻¹) was estimated using Maguire's equation [22].

$$GR = \sum Si/Di$$

GR= germination rate (The number of germination seeds per day), Si is the number of germinated seeds at each counting and Di is the number of days to nth count.

Data were analyzed as factorial ANOVA using JMP8. Where significant (p≤0.05), data means were separated by the LSD test.

RESULTS

Results showed with increasing in drought stress, there was significant difference between treatments in all evaluated traits germination rate, germination percent, root and shoot length. (p<0.01) [Table 1]. Results showed that, there are significant differences between germination ability both in percent and rate among 16 species. Stress also reduced the germination in some species markedly. Analysis of variance and mean comparison of this experiment shows that using salicylic acid could not increase plant tolerance to drought stress.

Table 1: Analysis of variance among studied traits of 16 ornamental annuals, and ** not significant and significant at 0.01 percent levels of probability, respectively

SV	Df	Germination percentage	Germination rate	Root length	Shoot length	Shoot fresh Weight	Shoot dry weight
Species	15	5046.38**	262.20**	122.84**	23.676**	0.08ns	0.0000233ns
Stress	1	13197.02**	634.73**	28.61**	87.68**	0.10ns	0.0000370 ns
SA	1	33.67 ns	0.57 ns	0.96 ns	0.28 ns	0.07 ns	0.0000108 ns
Species × Stress	15	1181.92**	51.05**	6.97**	2.53**	0.07 ns	0.0000140 ns
Species × SA	15	171.29 ns	7.39 ns	1.08 ns	0.24ns	0.07 ns	0.0000102 ns
Stress × SA	1	12.81 ns	9.73 ns	0.31 ns	0.01 ns	0.07 ns	0.0000262 ns
Species×Stress×SA	15	142.26 ns	4.85 ns	0.48 ns	0.34 ns	0.06 ns	0.0000076 ns
Error	128	156.49	7.27	0.63	0.27	0.07	0.000026
Total	191	678.96	33.88	10.95	2.78	0.071	0.00000001
C.V		39.65	48.72	91.78	63.19	698.02	168.69

Germination percent

According to the results of this experiment, drought stress significantly affected germination percent ($p \leq 0.01$). These results were also observed for different species [table 1]. Under drought stress treatment, germination percentage of *Callistephuschinensis* 'Milady Mix', *Gomphrena gnome* 'White', *Catharanthus roseus* 'Bright Eye', *Catharanthus roseus* 'Carmine' and *Celosia plumose* decreased 78.75% , 72.38%, 48.27%, 29.24% and 27.87% compared to control respectively. Although drought stress had no significant effect on germination percent of *Zinnia elegans* 'Lilliput rose', *Calendula officinalis*, *Gomphrena gnome* 'Pink', *Tagetispatula* 'Hero Harmony', *Tagetserecta* 'Discovery Yellow', *Ageratum houstonianum* 'Blue Danube', *Sanvitaliaprocombens*, *Pennisetumglaucum* 'Purple Majesty', *Petunia hybrida* Red, *Petunia hybrid*, *Gomphrena gnome* 'Purple' (Buddy) but it decreased 0.89%, 3.9%, 6.96%, 10.20%, 13.92%, 14.04%, 15%, 15.60%, 17.57%, 17.61%, and 27.10%, respectively [Table 2].

The highest germination percent (95%) was observed in *Ageratum houstonianum* 'Blue Danube' followed by *Zinnia elegans* 'Lilliput rose' (93.33%) and *Pennisetumglaucum* 'Purple Majesty' (90.83%) all in 100% FC treatment and the lowest value (14.16%) was observed in *Callistephuschinensis* 'Milady Mix' and *Sanvitaliaprocombens* (18.4%) in 50% FC [Table 2].

Table 2: Mean comparison of different germination indexes for 16 ornamental annuals Means within columns for each treatment with the same letters are not significantly different at 5% level

Treatment		Germination percentage (%)	Germination rate (day-1)	Root length (cm)	Shoot length (cm)
Seed	Stress (%FC)				
Zinnia elegans 'Lilliput rose'	100	93.33a	19.15ab	5.91ef	3.63d
	50	92.5ab	19.14ab	6.58de	2.56fgh
Ageratum houstonianum 'Blue Danube'	100	95a	19.08ab	4.8gh	4.52c
	50	81.66a-f	15.49cde	5.33fg	2.45ghi
Catharanthus roseus 'Bright Eye'	100	72.5fgh	15.06cde	1.99nop	2.05hij
	50	37.5kl	5.44j	1.42opq	1.36mno
Catharanthus roseus 'Carmine'	100	88.33a-d	16.31bc	2.74k-n	3.33de
	50	62.5hi	10.65hi	2.01nop	1.42k-o
Petunia hybrida 'Red'	100	75.83d-h	13.14d-h	2.29mno	3.03efg
	50	62.5hi	10.26hi	2.28mno	1.29nop
Petunia hybrid	100	80.83a-g	14.51f-i	3.96hi	2.98efg
	50	66.66ghi	11.58c-f	3.32i-l	2.26hi
Celosia plumose	100	86.66a-f	15.84cde	3.39ijk	2.94efg
	50	62.5hi	10.41hi	2.58k-n	1.97h-l
Gomphrena gnome 'Pink'	100	84.16a-f	15.84cde	3.84ij	3.23de
	50	78.33b-g	14.08c-g	2.97j-m	1.96i-m
Gomphrena gnome 'Purple' (Buddy)	100	40jk	6.41j	0.76grs	1.51j-n
	50	29.16klm	4.95jk	0.49rs	0.75p
Gomphrena gnome 'White'	100	87.5a-e	16.13bcd	1.16pqr	2.1hij
	50	24.16lmn	3.12jk	0.81qrs	1.14nop
Callistephuschinensis 'Milady Mix'	100	66.66ghi	10.69hi	5.48fg	5.16b
	50	14.16n	1.51k	2.99j-m	3.19de
Tagetispatula	100	81.66a-f	14.66c-f	0.45rs	1.4i-o
	50	73.33e-h	12.86e-h	0.33s	0.9op
Tagetserecta	100	62.5hi	11.05ghi	1.03grs	1.13nop
	50	53.8ig	9.51i	0.89grs	0.98nop

Calendula officinalis	100	77.5c-g	13.58c-g	8.47c	7.01a
	50	74.5d-g	12.97c-g	7.08d	3.13def
Sanvitaliaprocombens	100	21.66mn	2.59jk	2.42lmn	2.01h-k
	50	18.4mn	1.64k	2.06nop	1.30nop
Pennisetumglaucum 'Purple Majesty'	100	90.83abc	19.65a	15.62a	6.96a
	50	76.66c-h	15.44cde	9.92b	4.70bc

Germination rate

According to the results of this experiment, drought stress and species significantly affected germination rate ($p \leq 0.01$). [Table 1].

Under drought stress treatment, there was nearly no decrease in germination rate of *Zinnia elegans* 'Lilliput rose', but it significantly decreased for *Callistephuschinensis* 'Milady Mix', *Gomphrena gnome* 'White', *Catharanthus roseus* 'Bright Eye', *Catharanthus roseus* 'Carmine', *Celosia plumose*, *Pennisetumglaucum* 'Purple Majesty' and *Ageratum houstonianum* 'Blue Danube' 85.96%, 80.65%, 63.87%, 34.7%, 34.27%, 21.42% and 18.81% respectively. [Table 2]. The highest germination rate (19.65 day⁻¹) was observed in *Pennisetumglaucum* 'Purple Majesty' followed by *Zinnia elegans* 'Lilliput rose' (19.15 day⁻¹) and *Ageratum houstonianum* 'Blue Danube' (19.08 day⁻¹) all in 100% FC treatment and the lowest value (1.51 day⁻¹) was observed in *Callistephuschinensis* 'Milady Mix' followed by *Sanvitaliaprocombens* (1.64 day⁻¹) both in 50% FC [Table 2].

Root length

According to the results of this experiment, drought stress and species significantly affected root length ($p \leq 0.01$). [Table 1]. Drought stress showed different results for root length on different species. The decrease were 45.44%, 36.49% and 16.41% for *Callistephuschinensis* 'Milady Mix', *Pennisetumglaucum* 'Purple Majesty' and *Calendula officinalis*, respectively [Table 2].

The root length of *Zinnia elegans* 'Lilliput rose' and *Ageratum houstonianum* 'Blue Danube' were longer than the control when the seeds were treated with drought stress and this increase were, 11.33% and 11.04% respectively.

The highest and the lowest root length (15.62 and 0.33 cm) were observed in *Pennisetumglaucum* 'Purple Majesty' and *Tagetapatula* 'Hero Harmony' in 100% and 50% FC treatment, respectively. [Table 2].

Shoot length

According to the results of this experiment, drought stress and species significantly affected shoot length ($p \leq 0.01$). [Table 1]. Drought stress treatment, decreased the shoot length of all cultivars compared to their relative control, but it was not significant for *Gomphrena gnome* 'Pink', *Tagetapatula* 'Hero Harmony' and *Tagetaserecta* 'Discovery Yellow'.

The highest shoot length (7.01 cm) was observed in *Calendula officinalis* in 100% FC treatment and the lowest value (0.75 cm) was observed in *Gomphrena gnome* 'Purple' (Buddy) in 50% FC [Table 2].

Shoot and root fresh and dry weight

The results indicated that shoot and root fresh and dry weight of plants were not significantly affected by drought stress and species. but ($p \leq 0.01$) [Table 1].

DISCUSSION

These results indicated that drought stress treatment markedly decreased the germination percentage of all plants compared to their relative controls. Seed germination is negatively affected by drought stress [23]. If water absorption disturbed or delayed, it could delay in seed metabolic processes. Drought stress had the least effect on germination percent of *Zinnia elegans* 'Lilliput rose' and *Calendula officinalis*, whereas the germination percent of *Callistephuschinensis* 'Milady Mix' and *Gomphrena gnome* 'White' declined clearly under drought stress compared to their relative controls. Seeds for germination process must absorb enough water. Soluble material in the medium such as polyethylene glycol reduces water absorption and subsequent seed germination is delayed or stopped [24]. Drought stress treatment, had nearly no decrease in germination rate of *Zinnia elegans* 'Lilliput rose' but it decreased in other plants compared to their relative controls. The germination rate under drought stress can show the germination ability of drought resistance of various species [25]. It is resulted that time for radicle outting increased and therefore, germination rate is decreased [26]. This suggested that *Zinnia elegans* 'Lilliput rose' germinated more quickly than other plants, showing a stronger drought resistance of *Zinnia elegans* 'Lilliput rose'. Due to osmotic pressure loss under drought stress, water absorption process is disrupted and the alpha-amylase enzyme activity is inhibited [27]. Root is an important absorption organ of plants, developed level of roots is one of the main indexes of drought resistance [25]. The ability to develop extensive root systems contributes to differences among cultivars for drought tolerance and root length is considered an

important trait in selection of drought resistant cultivars [28,29]. In our study, root length decreased under drought stress treatment, more in *Callistephus chinensis* 'Milady Mix' than in the other plants compared to their relative controls, indicating a higher sensitivity to drought stress in this cultivar (species). The root length reduction in *Callistephus chinensis* 'Milady Mix' under drought stress may be associated to a reduced cellular division and elongation during germination [30]. Reduction of root length with increasing in water potential has been reported by Takel (2000). This results indicated the roots that growth under drought stress were longer but they were very thin and delicate. The root length of *Zinnia elegans* 'Lilliput rose' and *Ageratum houstonianum* 'Blue Danube' were longer than their control when the seeds were treated with drought stress suggesting that *Zinnia elegans* 'Lilliput rose' and *Ageratum houstonianum* 'Blue Danube' developed powerful root system to fully use of water under drought condition, thus showing stronger drought resistance. The results indicated that drought stress treatment, decreased the shoot length of all cultivars compared to their relative controls. Generally, germinated seeds in environments under stress conditions have shorter shoot and root [31]. With increasing drought stress, root and shoot length decreased [32]. Reducing in water absorption by seeds reduces secretion of the stress hormone and enzyme activity and it has negatively effect on seedling growth [33].

CONCLUSION

In general, drought stress imposed different reactions on ornamental plant seeds examined in this study. Results showed that, there are significant differences between germination ability both in percent and rate among 16 species. Stress also reduced the germination in some species markedly, but not in all. SA showed no noticeable effect. It seems, it is significantly related to the soak time and dosage of application of salicylic acid.

Overall it was obvious that germination abilities in this experiment can be pointed to species characteristics itself and secondly to drought stress. Therefore resistant and hardy species are suggested to be used for dry and low rainfall states. *Zinnia elegans* 'Lilliput rose' and *Ageratum houstonianum* 'Blue Danube' in this experiment, were most resistant to drought stress during seed germination and *Callistephus chinensis* 'Milady Mix' showed the least resistance.

CONFLICT OF INTEREST

There is no conflict of interest

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None

REFERENCES

- [1] Passioura JB. [2007] The drought environment physical, biological and agricultural perspectives. J. Exp. Bot. 58(2): 113-117.
- [2] Gamze O, Mehmet DK, Mehmet A. [2005] Effects of salt and drought stresses on germination and seedling growth of pea (*Pisum sativum* L, Turk J, Agric. 29: 237-242
- [3] Hadas A. [1976] Water uptake and germination of leguminous seeds in soils of changing matrix and osmotic water potential. J. Exp. Bot. 28: 977-985.
- [4] Turk MA, Rahmsn A, Tawaha M and Lee KD. [2004] Seed germination and seedling growth of three lentil cultivars under moisture stress. Asian J Plant Sci. 3: 394-397.
- [5] Baghizadeh A, Hajmohammadrezaei M. [2011] Effect of drought stress and its interaction with ascorbate and salicylic acid on Okra (*Hibiscus Esculents* L.) germination and seedling growth. *Journal of Stress Physiology and Biochemistry*. 7(1): 55-65.
- [6] Sevik H, Cetin M. [2014] Effects of water stress on seed germination for selecting landscape plants. Pol. J. Environ. Stud. 24 (2): 689-693.
- [7] Afzali SF, Hajabbasi MA, Shariatmadari H, Razmjoo K, Khoshgoftarmanesh AH. [2006] Comparative adverse effects of PEG- or NaCl- Induced osmotic stress on germination and early seedling growth of a potential medicinal plant *Matricaria chamomilla*, Pak. J. Bot. 38: 1709-1714.
- [8] Hamayun M, Khan SA, Shinwari ZK, Lee JJ. [2010] Effect of polyethylene glycol induced Drought stress on physiological attributes of soybean, Pak J, Bot. 42: 977-986.
- [9] Ahmad, MSA, Javed F, Ashraf M. [2007] Iso-osmotic effect of NaCl and PEG on growth, cations and free proline accumulation in callus tissue of two indica rice (*Oryza sativa* L.) genotypes. Plant Growth Regul. 53: 53-63.
- [10] Raziuddin Swati ZA, Bakht J, Farhatullah Ullah N, Shafi M, Akmal M, Hassan G. [2010] In situ assessment of morpho-physiological response of wheat (*Triticum aestivum* L.) genotypes to drought, Pak. J. Bot. 42: 3183-3195.
- [11] Davis PJ. [2005] Plant hormones: biosynthesis, signal transduction, action. Springer; 3rd edition. Kluwer Academic Publishers. Netherlands. 700.
- [12] Hayat Q, Hayat S, Irfan M and Ahmad A. [2009] Effect of exogenous salicylic acid under changing environment: A review. Environmental and Experimental Botany.
- [13] Harper JR and Balke NE. [1981] Characterization of the inhibition of K⁺ absorption in oats roots by salicylic acid. Plant Physiol. 68: 1349-1353.
- [14] Horvath E, Szalai G, Janda T. [2007] Induction of abiotic stress tolerance by salicylic acid signaling J. Plant Growth Regul. 26: 290-300
- [15] Mwale S, Hamusimbi C, Mwansa K. [2003] Germination emergence and growth of sunflower (*Helianthus Annuus* L.) in response to osmotic seed priming. Seed Science and Technology. 31: 199-206.
- [16] Okcu G, Kaya MD, Atak M. [2005] Effects of salt and drought stresses on germination and seedling growth of Pea (*Pisum Sativum* L). *Turkish Journal Agriculture and Forestry*. 237-242.
- [17] Patade VY, Maya K, Zakwan A. [2011] Seed priming mediated germination improvement and tolerance to

- subsequent exposure to cold and salt stress in capsicum. *Res J Seed Sci.* 4 (3): 125-136.
- [18] Shahi-Gharahlar A, Khademi O, Farhoudi R, Mirahmadi SF. [2010] Influence of salt (NaCl, CaCl₂, KNO₃) stress on germination and early seedling growth traits of cumin (*Cuminum cyminum* L.) seed. *Seed Science and Biotechnology.* 4(1): 37-40.
- [19] Khajeh HM, Powell AA, Bingham IJ. [2003] The interaction between salinity stress and seed Vigor during germination of soybean seed. *Seed Sci. Technol.* 1: 715-725.
- [20] Anaya F, Fghire R, Wahbi S, Loutfi K. [2015] Influence of salicylic acid on seed germination of *Vicia faba* L. under salt stress. *Journal of the Saudi Society of Agric. Sci.* In Press, Corrected Proof, Available online 31.
- [21] Belcher EW, Miller L. [1974] Influence of substrate moisture level on the germination of sweet gum and pine seed. *Association of Official Seed Analysts.* 65: 88-89.
- [22] Maguire JD. [1962] Speed of germination-aid in selection and evaluation for seedling emergence and vigor. *Crop Sci.* 2: 176-177.
- [23] Rad JS, Alfatemi MH, Rad MS, Sen DJ. [2013] Phytochemical and antimicrobial evaluation of the essential oils and antioxidant activity of aqueous extracts from flower and stem of *Sinapis arvensis* L. *American Journal of Advanced Drug Delivery.* 1(1): 1-10.
- [24] Tobe K, Li X, Omasa K. [2000] Seed germination and radicle growth of a halophyte, *Kalidium capsicum* (Chenopodiaceae). *Annals of botany.* 85: 391-396.
- [25] Liu M, Li M, Liu K, Sui N. [2015] Effects of drought stress on seed germination and seedling growth of different Maize varieties. *Journal of Agric. Sci.* 7(5).
- [26] Marchner H. [1995] Mineral nutrition of higher plants. Second reprint. Academic Press. 672.
- [27] Afzal I. [2005] Seed enhancements to induced salt tolerance in wheat (*Triticum aestivum* L.). Ph.D. thesis, Agricultural University of Faisalabad, Pakistan.
- [28] Turner NC. [1997] further progress in crop water relations. *Advances in Agronomy.* 58: 293-338.
- [29] Abd Allah AA, Badawy Shimaa A, Zayed BA, El-Gohary AA. [2010] the role of root system traits in the drought tolerance of rice (*Oryza sativa* L.). *World Acad Sci Eng Technol.* 68: 1378-1382.
- [30] Frazer TE, Silk WK, Rost TL. [1990] Effect of low water potential on cortical cell length in growing region of maize roots. *Plant Physiol.* 93: 648-651.
- [31] Katergi N, Van Hoorn JW, Hamdy A, Karam F, Mastrotilli M. [1994] Effect of salinity on emergence and on water stress early seedling growth of sunflower and maize. *Agricultural Water Management.* 26: 81-91.
- [32] Bayoumi TY, Manal H, Metwali EM. [2008] Application of physiological and biochemical indices as a screening techniques for drought tolerance in wheat genotypes. *African journal of biotechnology.* 14: 2341-2352.
- [33] Kafi Falavarjani M, Nezamy A, Hosseini H and Masomi A. [2005] Physiological effects of drought stress by polyethylene glycol on germination of lentil (*Lens culinaris* Medik.) genotypes. *Journal Iran of research Agronomy.* 3: 69-80.
- [34] Michel BE, Kaufmann MR. [1973] The osmotic potential of polyethylene glycol 6000. *Plant Physiol.* 51 (5): 914-916.
- [35] Takel A. [2000] Seedling emergence and growth of sorghum genotypes under variable soil moisture deficit. *Agronomy Journal.* 48: 95-102.

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ARTICLE

FEASIBILITY OF IMPLEMENTATION OF PERFORMANCE-BASED BUDGETING IN FARS GAS COMPANY

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ABSTRACT

The present study evaluates the feasibility of implementation of performance –based budgeting in Gas Company of Fars province. For feasibility of performance-based budget execution, a questionnaire and a model are presented. The study population is all top managers, budget experts, planning experts, project control experts, financial managers and financial experts (presenting documents, wage, plans, sale, property and goods) and various deputies of Gas Company of Fars province as 95 people and they are involved in various stages of budget (providing, regulation, approving, execution and supervision). The validity of measure is supported via content validity and its reliability is supported via Cronbach's alpha. This study has 4 main hypotheses and 9 sub-hypotheses. To support or reject hypotheses, Median, Kolmogorov-Smirnov test (K-S test) and t-test are applied. The results of study based on Shah model (2004) and three ability dimensions (performance evaluation, personnel and technical abilities) showed that respondents supported the performance evaluation ability in Gas Company of Fars province and they didn't support two other abilities as personnel and technical abilities. In addition, according to them, except organizational authority, regarding legal and procedural authorities, there were appropriate authorities in Gas Company of Fars province. Also, regarding political and managerial acceptance, there were suitable conditions but inIncentive compatibility, there was no good motivation for implementation. The results showed that implementation of performance-based budgeting were economical in Gas Company of Fars province.

INTRODUCTION

Budget is one of the most important decision making and managerial control tools as one of the main goals of organization management is allocation of limited resources to required plans and operation in the framework of macro managerial policies [1]. Performance budgeting system is one of the most efficient methods as applied in the past decades in developed and developing countries. In this system, budgeting is based on performance of organizational units and despite traditional budgeting, in performance-based budgeting system, instead of inputs, outputs and results are considered and there is a clear relationship between organizational outputs and its inputs. The change of budgeting system of country from current traditional method (as inefficient form the view of all experts) to performance-based budgeting has been on priority for government and parliament in the past years. Thus, relevant rules are designed and executed. Section 2, part (b) of Note 4 of budget rules in 2003, 2004, articles 138 and 144 of fourth development plan and its regulations, section 7 of budget executive codes in 2008, article 16 of management law of local services approved on September 30, 2007, section 32 of fifth development plan policies and article 219 of fifth development plan are the regulations as notified to create legal ground for this change.

Provincial Gas companies are distributed in the country and various activities are delegated to them. Like government, Gas Company performs all its financial activities including income, expenditures for various plans and duties in the framework of budget law. Thus, budgeting method is of great importance in fulfillment of goals of provincial Gas companies. Despite the benefits of performance-based budgeting, traditional budgeting is used in Gas Company. One of the basic problems of current budgeting system is that it is not performance-based and clear and this imposes great costs on countries including annual budget deficiency as thousands of billions Toman [2].

The final goal of performance-based budgeting is taking reasonable decisions about allocation and commitment of government resources based on measured outcomes as reflecting the expected results (performance) over time. By informing decision makers regarding better information about the results of each plan and set of plans to achieve common goals, performance-based budgeting increases the ability of decision makers to evaluate budget requests of executive systems and leads to better responsiveness of management for better performance and improvement of allocation of resources. The success of performance-based budgeting refers to the relationship between performance indices and resources allocation but most of the relations have not stable link (Kumarsi, 2008). The managers of provincial Gas companies should perceive the costs and processes of company exactly to achieve their

KEY WORDS

Performance-based budgeting, Programmed budgeting, Performance evaluation, Shah model, Gas Company of Fars province.

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goals well. The improvement of conditions and financial profitability of provincial Gas companies is dependent on the fact that how Gas is presented with the lowest cost as performance efficiency is increased. Now, the calculation of gas cost in Gas Company of Fars province is not suitable and required information is not provided for decision making. Thus, it is necessary to conduct a study on a system eliminating the problems and presenting the suitable information.

As it was said regarding the weaknesses of traditional budgeting method and advantages of performance-based budgeting, the present study evaluates the feasibility of implementation of performance-based budgeting for gradual reform of budgeting process and design of the model of implementation of performance-based budgeting system.

Theoretical basic

Performance-based budgeting (PBB)

In PBB, besides separation of credits to duties, plans, activities, operation volume and costs of execution of government performance and state systems in accordance to scientific methods as cost accounting and work evaluation methods can be measured. In programmed budget, budget classification is performed based on national goals, plans and different activities. If we use exact methods and criteria in estimation of cost of each activity, as allocated credit indicates the volume and amount of the activity and labor and performance are considered in control stage, we can achieve exact concept of programmed budget as called performance-based budget [3]. PBB is the budget regulated based on duties, performance and projects as the state organizations are responsible to execute it. In PBB, instead of considering the requirements of activities, we consider the activities and its expenditures (Mac gill, 2007). PBB is not a new phenomenon and it is organized and composed of useful aspects of other experienced budgeting in the past [4].

PBB (performance-based budgeting) attempts to establish a clear relationship between inputs and results (outputs and outcomes) and allocation of budget credits based on performance information with the aim of increasing effectiveness and efficiency in organizations [5].

Explanation of effective factors on successful execution of PBB by Shah model (2004)

The justifications regarding PBB execution have created some beliefs regarding effective factors on successful execution of this system. Such complex of the views was presented in SHAH governmental department model (2004). This model emphasizes on three effective factors in PBB execution: Ability, Authority and Acceptance. The studies show that interaction of these three factors determines reforms in execution of PBB [6]. Each factor is explained as followings:

Ability of PBB execution

One of the common assumptions regarding unsuccessful execution of PBB is low capacity or human inability of organization. The reports regarding PBB show that three dimensions of organizational ability are important to take performance-based budgeting: Performance evaluation ability, personnel ability and technical ability. Performance evaluation ability affects all stages of PBB execution [7]. If the governments cannot assess performance well, performance budgeting is failed. Most governments have found that assessment of result and output is time-consuming and difficult and most of them try to define the results and outputs. Sometimes, it is possible the existing problems in performance evaluation eliminate the potential execution of performance-based budget. Based on the development of performance evaluation industry and formation of required abilities in governments, these problems are reduced. For significant execution of PBB, the information of performance evaluation should be used in management, decision making, allocation of resources and design of encouraging plans. Another important point is that the information of performance evaluation should be reliable.

The studies emphasize on the importance of reliability of empowerment of human resources for performance-based budgeting. The required empowerments are different and are associated to all stages of PBB execution. The experience of governments regarding the PBB shows the importance of technical abilities. The specific technical requirements should be provided to collect data of performance and databases should be provided by which immediate performance information is presented as suitable for various range of uses. Databases should be consistent with wide range of other systems providing a basis for accounting, supervision and reporting in government.

If performance information is separated technically from other accounting and budgeting operation, PBB doesn't perceive decision making processes of other performances. If accounting system is based on input data, the performance-based information is not facilitated [8]. It seems that many governments are in evaluation of required technologies for execution of PBB and most of financial management systems are encountered with problem and it is important in decision making. Some people believe that shortage of required financial resources to develop new financial systems is one of the most important problems in PBB execution.

Authority in PBB execution

The second factor as effective to execute PBB is associated to the authority mechanisms of governments. If the budgeting experts don't have required authority in PBB execution, the execution is problematic. There are three important dimensions of authority: Legal authority, procedural authority and organizational authority.

As budget is regulated on inputs in some governments, using performance information in budget is different. The minimum use of performance information in budget is justified on the fact that budget is approved without performance information [6].

Performance evaluation and potential use of performance information is ignored mostly in budget procedures. The feature of existing processes is formal procedures as obliging budgeting behavior as a rule. Successful execution of reforms requires adaptation of reforms model with the rules and procedures.

In some governments, budget rules and procedures emphasize on inputs and exact explanation of chapters of costs and this reduces the potential role of information of performance evaluation. The managers and law makers are obliged to emphasize on inputs and they don't have required authority for measurements by other forms. For example, in California, limited use of performance information by law makers is based on existing procedures of former budgeting system.

There are many traditional budgeting procedures despite the obligation of decision makers to use the information of performance-based budgeting [8]. If budget processes and procedures reduce the role of information of performance evaluation in decision making, creating a performance-based budget system is difficult.

Organizational authority is effective on performance-based budgeting execution namely if performance information is used. PBB is executed effectively if required authorities are delegated and managers are allowed to decide regarding employment, reporting and etc. and required authorities should provide such decision making power.

In US, most of state authorities think how they can delegate required authorities to managers to apply the performance information in their decisions effectively but political limitations remain and are not considered mostly. The political authorities and managers are not free regarding the use of results-based information and this restricts using the information.

Acceptance in execution of PBB

Resistance to reforms by some of state authorities, chiefs of sectors and employees is the greatest barrier for execution and using performance evaluation [9]. If PBB is accepted by these groups, it is executed mostly. If it is expressed, for successful execution of PBB, state authorities, administrative managers and employees should be convinced PBB is based on reduction and achieving short and long-term benefits of state and society. Three aspects of acceptance are required: Political acceptance, managerial acceptance and Incentive compatibility.

Political authorities acceptance is of great importance in support and funding for execution of PBB. The evaluation and using performance information has some outcomes for selective and attributing authorities. Some authorities emphasize that policy makers resist against using performance information in allocation decisions as such information increases their vulnerability against people. Namely regarding long-term plans that can not be executed well in short-term. The performance information for political authorities in budget decisions is a threat as this question is raised that what is the authority of political authorities in using the information of performance evaluation? In political decisions, short-term goals are considered instead of long-term goals.

The investigations show that acceptance of PBB by managers namely regarding the performance information in managerial decisions and creating incentive plans is necessary. A basic challenge in PBB is convincing managers regarding the value of strategic plans and performance evaluation[8].

The experts in PBB believe in incentive strategy to use performance-based information and they consider that motivations should be a part of PBB. It is believed that budgeting systems and process-based systems create incentives vs. result-based approach.

The role of economic aspects

Another factor important in implementation of PBB is the thought of law makers, political authorities, managers and all employees of organization of PBB. For example, management is suitable for income resources and organization cost, reduction of processing cost of information to be applied by managers or facilitation of relationship of system users with relevant software or improvement of human resources. Generally, if PBB experts don't consider the economic benefits of PBB, they will be failed and this disturbs successful execution of this system.

Review of Literature

Local studies

Pourzamani and Naderi [10] evaluated the effect of acceptance, ability and authority on PBB in free commercial-industrial zones in Iran. The study findings showed that the mean of rank of evaluation of women and men had not significant difference. Also, the results showed that the mean of evaluation rank if age groups and organizational position and education of variables had not significant difference.

Sheikholeslami Nasab [11] identified effective internal and external factors on PBB execution in Khuzestan governor office by SWOT method. This model considered six factors (management, planning, cost management, performance management, change management, responsiveness and incentive) as necessary in the change of budgeting system to performance-based budgeting. The results of study showed that PBB in studied organization was an unrealistic PBB as at first credit is given to organization, then plans were written in details. Another problem among the employees was lack of motivation for implementation of PBB and it was an impossible issue. Also, low authority of managers of organization and executive systems to promote this goal and lack of uniform databases in organization were some barriers in this regard.

Moradi et al., [2012] evaluated the possibility of implementation of PBB in municipality of Shiraz. Based on SHAH model the study findings concerning the subjects were negative in relation to three authority dimensions namely the authority to assess the performance and human and technical abilities and there was not the authority necessary to execute PBB and the subjects believed there was appropriate authority in Shiraz municipality in relation to three power dimensions namely legal, procedural and organizational authority. Also there were good conditions in relation to dimension namely political and Managerial acceptance, but there was not appropriate motive for the performance in another dimension of acceptance, that was, incentive compatibility. Also the findings showed that PBB had deceased the expense in Shiraz municipality.

Mahdavi and Golmohammadi [12] evaluated the familiarity of top financial managers of executive systems of Fars province by new budgeting methods. The study findings showed that PBB was a good alternative for traditional methods in Iran compared to other new methods of budgeting. Familiarity of top financial managers, executive systems of Fars province with new budgeting methods like zero-based

budgeting method, programmed budgeting method and planning, budget systems were low (lower than average). However, their familiarity with PBB was an exception. Also, top managers of executive systems of Fars province, didn't consider the applied budgeting method in executive system and were agree mostly with the changes of budgeting method and their familiarity with alternative budgeting methods was low.

International researches

Andrew (6) showed that PBB execution possibility is in the states in which there adequate professional abilities for such changes and authorities have high power to apply such reforms. He referred to SHAH model and presented three effective factors on execution of PBB as ability, authority and acceptance.

Burner and Lee [2004] found that by effectiveness indices of performance, productivity rates in state budgets were reduced during 1990-2000. They also found that during the time periods in which financial resources are changed, these indices are improved mostly.

Blumentritt, T. [13] in the study of “Integrating Strategic Management and budgeting” showed that managers faced great challenges as moving toward budgeting and strategic planning and budgets had no association with commercial and performance strategies and a budget couldn’t be efficient unless the organization had strategic decisions. Strategic management and budgeting were separated but they had dependent activities. If they were applied well, both of them could improve performance better.

Yahaya, Ahmad NNN, Fatima, A.H.[14] in the study “Budgetary participation and performance: some Malaysian evidence evaluated the budgetary participation and performance in ministry of defense of Malaysia. The results of study showed that budgetary behavior in state organizations in developed countries was different from what was observed in developing countries. G. Eyonga [15] in the study “PBB, increasing productivity and change in budget (case study of ministry of trade in US) found that although some studies were reported that PBB increased state productivity in improvement plans, one issue was raised about successful execution of PBB: Allocated productivity.

Study hypotheses

Hypothesis 1: Performance-based budgeting implementation ability is observed in Gas Company of Fars province.

- Sub-hypothesis 1: There is performance evaluation ability based on PBB goals.
- Sub-hypothesis 2: There is performance evaluation ability in terms of personnel.
- Sub-hypothesis 3: There is performance evaluation ability in terms of technical ability.
- Hypothesis 2: There are appropriate authorities to implement PBB in Gas Company of Fars province.
- Fourth sub-hypothesis: Legal authority is given to Gas Company of Fars province to implement PBB.
- Fifth sub-hypothesis: Procedural authority is given to Gas Company of Fars province to implement PBB.
- Sixth sub-hypothesis: Organizational authority is given to Gas company of Fars province to implement PBB.
- Hypothesis 3: There is appropriate acceptance to implement PBB in Gas Company of Fars province.
- Sub-hypothesis 7: There is appropriate political acceptance to implement PBB in Gas Company of Fars province.
- Sub-hypothesis 8: There is appropriate managerial acceptance to implement PBB in Gas Company of Fars province.
- Sub-hypothesis 9: There is appropriate incentive compatibility to implement PBB in Gas Company of Fars province.

Hypothesis 4: Implementation of PBB is economical in Gas Company of Fars province.

MATERIALS AND METHODS

Study method

Conceptual model and study variables

In this study, Shah Model is used in which three effective factors on PBB are presented: Ability, authority and acceptance. Each of the dimensions is divided into small dimensions. The study model is shown in [Table 1].

Table 1: Effective factors on implementation of PBB



Data collection methods

Research plans are divided into empirical and quasi-empirical. Based on the features of each of plans, this study is in quasi-empirical studies. For data collection to test the hypotheses, survey research method is used. For data collection, a questionnaire with 7 general questions and 65 specialized questions are used. In theoretical section, for data collection, library method is applied. In this study, to be sure of content validity, questions of questionnaire are corrected and finalized by experts in some stages. To evaluate the reliability of questionnaire, Cronbach's alpha is applied. At first, 25 questionnaires are distributed randomly among the samples. The results of Cronbach's alpha for relevant questions of study hypotheses are shown in [Table 3].

Study population and sample

The study population is all top managers, budget experts, planning experts, project control experts, financial managers and financial experts (providing documents, wage and plans, etc.) and different deputies of Gas Company of Fars province in 2014 and they are presented in [Table 2]. Also, they are involved in different stages of budget (providing, approving, execution and supervision).

To reduce first type error (false rejection) and second type error (false support) and increasing test power, no sampling was performed and total population was investigated. Other purposes of study regarding total test of study population is avoiding the errors of sampling as mistaking in sampling is an important factor affecting statistical significance. In this study, sample size is equal to total study population. Thus, sampling method is not applicable in this study.

Table 2: Study population

NO.	Explanation	Samples number	Distributed	Received	Return rate
1	Financial experts	30	30	27	90%
2	Financial authorities	30	30	25	83%
3	Planning and education experts	20	20	14	70%
4	Management and deputies and top authorities	15	15	12	80%
Total		95	95	78	82%

Data analysis method and results test

To analyze the data of questionnaire, descriptive and inferential methods are used. For qualitative analysis of general data of respondents, descriptive statistics as classification and organizing information, relative and absolute frequency distribution is used. In this study, to test normality of data, K-S test is used. Based on normality or non-normality of data distribution, by “single t-test” and “Median test” at confidence interval 95%, study hypotheses are tested. To test the hypotheses, the required data are analyzed after collection, processing by SPSS, Excel software as followings:

- Descriptive: For qualitative analysis of general information of questions of first section of questionnaire (general), descriptive statistics (mean, median, mode and SD) are used.
- Inferential: By t-parametric test (single sample) and Q_p non-parametric test (median test) is tested at confidence interval 95% and error 5%.

In this method, by SPSS software, Cronbach's alpha is computed for questions of each hypothesis. These tests respond the question whether the questions in questionnaire are based on purpose and study topic? The results of computation of Cronbach's alpha for relevant questions of study hypotheses are shown in [Table 3].

Table 3: Results of Cronbach's alpha

Hypothesis	Cronbach's alpha test	Hypothesis	Cronbach's alpha test	Hypothesis	Cronbach's alpha test
First sub-hypothesis	0.91	Fourth sub-hypothesis	0.88	Sevenths subhypothesis	0.96
Second hypothesis sub-	0.89	Fifth sub-hypothesis	0.90	Eighths subhypothesis	0.94
Third hypothesis sub-	0.92	Sixth sub-hypothesis	0.93	Ninth subhypothesis	0.89
First main hypothesis	0.92	Main second hypothesis	0.91	Main third hypothesis	0.94

RESULTS

Results analysis

Descriptive statistics

The results of descriptive statistics showed that among 78 respondents, 55 people were 83.3% men and the rest women. Based on the age of respondents, 2.6% of them were at age range 20-30 years and 34.6% between 30 to 40 years and 53.8% above 40 years. The results of analysis of education showed that 74.4% of respondents had above BA degree. The education of respondents showed that 46.2% of respondents were in accounting, 21.8% in industrial management, 3.8% in business management, 1.3% in financial management, 5.1% in industry engineering and the rest in other fields. Work experience showed that 65.4% had more than 10 years of experience. The evaluation of participation of respondents in PBB showed that only 6.4% of respondents participated in this period and the rest of respondents had no participation in this period.

Table 4: Descriptive statistics and the results of normality of hypotheses

Hypothesis	N	Mean	Median	Mode	K-S test	Significance
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	level					
First main hypothesis	78	2.96806	2.89524	2.752	1.383	0.044
First subhypothesis	78	3.56068	3.40000	3.400	1.734	0.005
Third sub-hypothesis	78	2.62920	2.57143	2.286	1.719	0.005
Fourth sub-hypothesis	78	3.99231	4	4	1.982	0.001
Fifth sub-hypothesis	78	3.70513	4	4	2.374	0.000
Sixth sub-hypothesis	78	2.67521	2.66667	2	1.643	0.009
Seventh sub-hypothesis	78	3.75214	3.66667	4	1.694	0.006
Eighths subhypothesis	78	3.76923	3.75000	3.750	1.906	0.001
Main fourth hypothesis	78	3.81624	3.66667	3.667	1.781	0.004

Table 5: Descriptive statistics and results of normality test of hypotheses

Hypothesis	N	Mean	SD	K-S test	Significance level
Second sub-hypothesis	78	2.71429	0.609097	1.246	0.090
Main second hypothesis	78	3.45755	0.393313	0.880	0.420
Third main hypothesis	78	3.35969	0.341849	0.838	0.484
Ninth sub-hypothesis	78	2.55769	0.707018	1.328	0.059

Inferential statistics

[Table 5-1] shows the results of statistical test of main first and fourth hypotheses and first, third, fourth, fifth, sixth, seventh and eighth sub-hypotheses of study. As the results of normality test showed that frequency distribution of these hypotheses are not normal, the hypotheses were evaluated by median test. The results of this test based on each hypothesis are shown in the following [Table 6].

Table 6: The results of statistical test of hypotheses by Median test

Hypothesis	Level	N	Observed percent	Test ratio	Probability value	Result
Main first hypothesis	Smaller or	50	0.64	0.5	0.017	Supported

	equal to median					H ₀
	Bigger than median	28	0.36			
	Total	78	1.00			
First subhypothesis	Smaller or equal to median	1	0.01	0.5	0.000	rejectedH ₀
	Bigger than median	77	0.99			
	Total	78	1.00			
Third sub-hypothesis	Smaller or equal to median	68	0.87	0.5	0.000	Supported H ₀
	Bigger than median	10	0.13			
	Total	78	1.00			
Fourth sub-hypothesis	Smaller or equal to median	4	0.05	0.5	0.000	rejected H ₀
	Bigger than median	74	0.95			
	Total	78	1.00			
Fifth sub-hypothesis	Smaller or equal to median	19	0.24	0.5	0.000	rejectedH ₀
	Bigger than median	59	0.76			
	Total	78	1.00			
Sixth sub-hypothesis	Smaller or equal to median	59	0.76	0.5	0.000	Supported H ₀
	Bigger than median	19	0.24			
	Total	78	1.00			
Seventh sub-hypothesis	Smaller or equal to median	2	0.03	0.5	0.000	rejectedH ₀
	Bigger than median	76	0.97			
	Total	78	1.00			
Eighths	Smaller or	1	0.01	0.5	0.000	rejectedH ₀

subhypothesis	equal to median					
	Bigger than median	77	0.99			
	Total	78	1.00			
Main fourth hypothesis	Smaller or equal to median	2	0.03	0.5	0.000	rejectedH ₀
	Bigger than median	76	0.97			
	Total	78	1.00			

The results of normality test show that frequency distribution of second subhypothesis, main second hypothesis, third main hypothesis and ninth sub-hypothesis is normal. Thus, hypotheses are evaluated by single t-test. The results in [Table 5] show the support of main second and third hypotheses and rejection of second and ninth sub-hypotheses.

Table 7: The results of statistical test of hypotheses by single t-test

Tested value=3							
Hypothesis	t-statistics	Degree of freedom	Significance probability	Difference of mean	Confidence interval 95% for mean difference		Result
					Lower bound	Upper bound	
Second sub-hypothesis	-4.143	77	0.000	-0.285714	-0.42304	-0.14838	Supported H ₀
Second main hypothesis	10.274	77	0.000	0.457550	0.36887	0.54623	RejectedH ₀
Third main hypothesis	9.293	77	0.000	0.359687	0.28261	0.43676	Rejected H ₀
Ninths sub-hypothesis	-5.525	77	0.000	-0.442308	-0.60172	-0.28290	SupportedH ₀

As it was said, the results of hypotheses test showed that respondents supported performance evaluation ability in Gas Company of Fars province and rejected other two ability dimensions as personnel ability and technical ability. In addition, from the view of mentioned people, except organizational authority, there were appropriate authorities regarding legal and procedural authorities in Gas Company of Fars province. Regarding political and managerial acceptance, there were suitable conditions but in incentive compatibility, there was no suitable motivation for implementation. Also, the results showed that implementation of PBB were economical in Gas Company of Fars province.

CONCLUSION AND RECOMMENDATIONS

The budget of executive systems is one of the most important policy making tools, decision making and planning to execute development strategy and can reflect all plans and activities of government. Also, it plays important role in national economy development as financial policy tool and stabilizing economic fluctuations and cost criterion and efficiency evaluation of executive systems. In the present study, some recommendations are presented and based on new topic of PBB and its effect on performance of various sectors of society as:

- 1- Based on the result of second sub-hypothesis and inability of personnel in implemented of PBB, the followings are necessary:
 - Formulation of educational plans and execution of short-term courses increasing the intellectual capabilities of human resources and they play important role in their empowerment.
 - It is required that all financial experts and planning of or organization take required training in PBB.
 - If the management divides its power via delegating authority to the subordinates, according to communication approach in management, empowerment of employees is increased. By increasing internal motivation of employees for performing duties via positive experiences achieved by employees directly, empowerment of employees is increased according to cognitive approach.
 - Experts are provided regarding evaluation and improvement of performance from quantitative and qualitative aspects.
 - Required financial experts for reforms in accounting system and costs of goods and services can be provided from quantitative and qualitative aspects.
 - Various sessions to establish norms to implement this system and its establishing.
- 2- Based on the result of third sub-hypothesis and technical inability in implementation of PBB, the following measurements are necessary:
 - Improvement of ability requires improvement of information systems as required databases are created by which immediate performance information is provided as suitable for wide range of users.
 - The coordination between existing systems is the most important principle in improving technical ability as the required information is from a unite system and it provides a basis for accounting, supervision and reporting in Gas company.
 - The required budget for execution of PBB and performance evaluation should be considered.
- 3- Based on the result of sixth subhypothesis and lack of appropriate organizational authority to implement PBB, the followings are performed.
 - Organizational authorities to top and middle managers to promote PBB goals.
 - Explanation of the duties of managers and authorities as involved directly in budgeting process of company should be reviewed and defined based on PBB goals.
- 4- Based on ninth sub-hypothesis and lack of incentive compatibility to implement PBB, the followings should be done:
 - By using qualified employees in terms of education, experience and specialization in budgeting and creating suitable qualification system and good punishment and benefits system and establishing appropriate wage, PBB execution is successful.
 - Some incentives can be defined for performance management based on continuous improvement.
 - The managers of organization can apply the information of performance evaluation in their decisions and design and execute macro policies in this field.

For preparation of implementation of PBB, the followings should be considered:

- Regarding the formulation of required rules and execution of PBB, in case of any contrast, the contradictions can be eliminated.
- In financial and budget rules of state, freedom is presented for organizations regarding budget request and costing.
- Required authorities to execute PBB are delegated by top organizations.
- Via training and holding justification sessions, managers of organization can be aware of PBB and this is useful in acceptance of PBB.

Limitations of study

There are some limitations in each study and these limitations are the barriers of generalizing the results of study. There are some limitations in this study affecting the results and findings of study. Some limitations of various stages of theoretical structure, measurement and collection of data are presented as:

- 1- Lack of adequate motivation for active participation in scientific study among the selected population is one of the limitations of this study.
- 2- Gas Company is one of the state organizations; respondents are concerned of presenting information to high authorities.
- 3- This study is encountered with inherent limitations of questionnaire for data collection. For example, the questionnaire cannot measure the subjects views completely.

Recommendations for further studies

The changes process in “budgeting system” and “accounting system and financial reporting” requires proper perception of the role and importance of these two systems in general responsiveness. We should clarify the role of annual budget as the financial responsiveness of government and unique role of accounting and financial reporting as one of the main tools of fulfilling and improving these two responsibilities for authorities, policy makers and relevant institutions and financial and budgetary affairs and they should be turned into public opinion of these authorities.

According to section 32 of general policies of fifth development plan and article 219 of fifth development plan and required regulations to create legal ground to establish PBB and reformation of budgeting structure as services costs, the research regarding the evaluation of effective factors in successful execution of this system besides recognizing existing condition can be useful in evaluation of solutions of good ground to executive units. Some recommendations in this regard are as followings:

- 1- As PBB is implemented in our country, based on this implementation, the complementary tool of performance of this system, PBB should be implemented as well as state budgeting system and finally state financial system can achieve its great goals and be responsive as a strong tool and also plays important role for economic progress of country.
- 2- Based on the importance of cost accounting and the benefits of costing system based on mechanism, using costing system in Gas Companies can be on priority.
- 3- Review of financial rules in Gas companies and presenting suitable solution of formulating rules and improvement of performance along establishing PBB.
- 4- Conducting this study in Gas Company of other provinces.
- 5- Evaluation of feasibility of PBB in other state organizations.

CONFLICT OF INTEREST

There is no conflict of interest

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REFERENCES

- [1] MokhtariNaseri, Keivan. [2008] Performance budget.
- [2] Mahdavi, Abdolhamid. [2006]The report of research plan of PBB for executive systems of Kerman province. Tehran. The center of applied researches of management of Tehran University.
- [3] Qaderi, Mohammad R. [2006] New state budgeting. Tehran. First edition. Planning and management organization.
- [4] Yusefnejad, Abolfazl. [2007]The analysis and pathology of change process to performance-based budgeting system. Audit knowledge. 21.
- [5] Hassanabadi, Mohammad,NajarSaraf, Alireza. [2010] Application of performance information in budgeting system. TEHRAN. Education and industrial research center of Iran.
- [6] Andrewm.[2004] Authority, Acceptance, Ability and Performance – Based Budgeting Reforms,*TheInternational Journal Of Public Sector Management*. 17(4):334,336.
- [7] Harris j.[2001]Performance Budgeting In Maine, Paper Presented At The Managing Performance Conference, Bal more.
- [8] Asadi, Mahmood,Ebrahimi, Mohsen, Babashahi, Jabar. [2009]The identification of barriers of establishing budgeting system in customs of Islamic Republic of Iran based on SHAH model.
- [9] Robinson M, BrumbyJ. [2005] Does Performance Budgeting Work? An Analytical Review of the Empirical Literature,IMF Working Paper. 3 – 5.
- [10] Pourzamani, Zahra,Naderi, Babak. [2012]The evaluation of barriers of establishing performance budgeting in free commercial-industrial zones of Iran. *Journal of accounting. Health*.1:1-16.
- [11] SheikholeslamiNasab, Shariat. [2011]The evaluation of establishment of PBB in management and planning organization of Khuzestan province by SWOT matrix.
- [12] Mahdavi, Abdolhamid. [2006]The report of research plan of PBB for executive systems of Kerman province. Tehran. The center of applied researches of management of Tehran University

- [13] Blumentritt T. [2006] Integrating Strategic Management and budgeting. *Journal Of Business Strategy*. 27(6):73-79.
- [14] YahyaMN, Ahmad NNN, Fatima AH.[2008]Budgetary participation and performance: some Malaysian evidence,*International Journal of Public Sector Management*. 21(6):658 – 673
- [15] Mashaykhi, Bita,AbdzadeKanafi, Mohammad Faraji, Omid. [2013]The feasibility of design and establishing PBB in state Universities of Iran (Case study of Tehran University). *Scientific-research journal of knowledge*.Fourth plan of economic development.[2005] Planning and development organization.138-144.
- [16] McGill, Ronald. [2007] PBB. *Journal of management promotion and development*. State management. Translated by Mohammad Hassan Abadi and AlirezaSarafNajar. First year. 3.
- [17] Beyond Budget Rationalities: [2009] The Social Structure Performance Budgeting and Its Indirect Effectson Organizational Performance Within Public Organizations.113-115.

ARTICLE

COMMODITY PRICE SHOCKS AND BUSINESS CYCLE

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ABSTRACT

In recent years, commodity price shocks have been destabilizing the country's economy in different ways and they have extended to capital markets, foreign exchange, and Tehran Stock Exchange as well which have slowed economic growth. In this paper, we study factors affecting commodity price shocks and business cycle through SVAR in the period 1987-2014. Regression method and SVAR econometric model will be used for analysis. It can be concluded that the commodity price shocks of the prior period have a significant and positive impact on the commodity price shocks of the current period, moreover, factors such as increased ratio of export to import and the food and energy price index increase the probability of commodity price shock. In addition, by an increase in investment share and growth in labor productivity, the probability of commodity price shock in business cycle will decrease.

INTRODUCTION

In this paper, we will investigate the effect of different economic factors on commodity price shocks. After targeted subsidies, Iran is dealing with price shock in goods and services and since in global markets the price of Iranian goods has raised, other parties no longer have tendency to trade with Iran. Here, through a different perspective, we relate the resulting inflation in the country to other economic indicators but targeted subsidies.

The research variables are listed in the [Table 1] below:

KEY WORDS

commodity price
shocks, business cycle,
SVAR econometric
method

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Table 1: The introduction of variables

Variable
Growth in labor productivity
Capital
Inflation rate
Nominal interest rate
Employment rate
CPI
Consumption share
Share of investment
Point-to-point inflation
Food and energy price index
Rate of export to import
Continuous commodity index

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Research background

MajidSabaghKermani and VahidShaghaghShahri studied factors affecting real exchange rate in Iran during the period 1959-2001; they employed the vector autoregression model and found determining factors of the long-term and short-term behavior of real exchange rate in Iran. Their results suggested that during this time, increased federal deficit, trade relation and the volume of money enhanced real exchange rate of Iran's economy. The increase in variables including import taxes, net foreign assets and also oil prices reduces real exchange rate. Therefore, by improving public finance – which leads to increased national savings – real interest rate will decrease and consequently real price of oil will fall as well. An increase in real oil price will enhance the value of the domestic currency, therefore, prices of traded goods and state budget deficit would affect exchange rate. The implementation of monetary policy in real fixed exchange rate regime, increases non-commercial prices in comparison with prices of imported goods at a

faster rate, consequently, there will be low current account and foreign reserves but high exchange rate. Variables such as foreign assets and import restrictions also decrease Iran's exchange rate.

Parviz Mohammadzadeh had an article named "The relationship between budget deficit and demand for money in the period 1959-2002 in Iran"; he studied budget deficit issue. He considered Keynesian, Ricardian equivalence, and neoclassical theories. Regarding Iran's macroeconomic data in that time, there is a long-term equilibrium relation between budget deficit and demand for money and Keynesian theory works well for Iran's economy and also the issue of budget deficit in Iran's economy has important and key effects on real variables.

Mahmoud Khataei and Younes Gharbali Moghadam [1] studied the dynamic relationship between exchange rate and gross domestic product of Iran's economy during the period 1959-2000. According to the results, there is a negative relationship between real exchange rate and GDP in a long term.

Dr. Seyed Komeyl Tabibi and Dr. Khadijeh Nasallahi [2] studied the role of key variables in the determination of the behavior of Iran's long-term equilibrium exchange rate and analyzed factors provided by supply and demand in the economy including changes in state fiscal policy, changes in international finance situation, the difference in the growth rate of the efficiency of commercial and non-commercial sectors, changes in exchange relation, and changes in trade policies. In this research, variables such as total efficiency of productivity factors, the current cost of government construction as government financial policy index, internal exchange relation, the central bank's foreign exchange reserves to the monetary base, and investment exchange intensity index explain the behavior of Iran's real exchange rate. Through econometric methods their long-term effects on the behavior of real exchange rate were determined then evaluated. Due to the structure of Iran's foreign exchange market in which at least five real effective exchange rates in the shape of real effective rate of official exchange, real effective exchange rate of the parallel market, real effective exchange rate of the final export, real effective foreign exchange rate, and real effective exchange rate of foreign exchange payments in the currency market are dominating there, the results suggest that directions of the impacts of mentioned variables depend on REER and the short-term imbalance of all the effective rates – except for parallel market – will be adjusted slowly in a long term.

Matthias Gubler, et al [3] investigated the impact of business cycles on commodity price shocks and considered all unforeseen changes in commodity prices of America's market as shocks. They concluded that unexpected price shocks are under the influence of many macroeconomic variables.

Stationary and stability

The easiest way to determine the stationary of a variable is by looking at its vector. However, this method is not accurate enough and we should test the stationary of a time series variable. Unit root test is a common test which is used for determining the stationary of a time series variable. For clarification, consider the following first-order vector auto-regression process:

$$Y_t = \varphi Y_{t-1} + \varepsilon_t$$

Where coefficient φ is estimated by ordinary least squares method (OLS) and is equal to 1, we can study the stationary and non-stationary status of a time series process. Therefore, when $1 \geq |\varphi|$, Y is a non-static time series and its variance will increase over time and approach infinity. If $|\varphi| < 1$, Y is a static time series (or a static difference). Hence, when the value of φ is strongly less than 1, the stationary or difference of a time series can be estimated. Null hypothesis ($H_0: \varphi = 1$) vs. alternative hypothesis ($H_1: \varphi < 1$).

Dicky-Fuller (DF) and Augment Dicky-Fuller (ADF) tests

By estimating the following equation after subtracting Y_{t-1} from both sides of the equation, standard DF test will be done as follows:

$$(\varphi - 1) Y_{t-1} + \varepsilon_t = (Y_t - Y_{t-1})$$

Where $\delta = \varphi - 1$. Therefore, null hypothesis and alternative hypothesis for the reliability of time series would set out as follows:

$$\begin{cases} H_0 = \delta = 0 \\ H_1 = \delta < 0 \end{cases}$$

T statistic is the obvious statistic of null hypothesis and it is calculated as follows:

$$\frac{\hat{\delta}}{se(\hat{\delta})} t =$$

Where $\hat{\delta}$ is estimation and $se(\hat{\delta})$ is the standard deviation of the coefficient. The main problem of this test is that the t statistic provided by ordinary least squares method has a unit root regarding the null hypothesis but is not distributed normally and it does not have a standard shape. Dicky and Fuller (1979) suggested that regarding null hypothesis, the unit root of this statistic does not follow normal t distribution, therefore, t critical quantity cannot be used for this test. They offered

a practical solution in which τ test is used instead of t test because it has a limiting distribution. The critical values of τ for tests and different sample sizes have achieved through Dicky-Fuller simulation methods and are listed in tables. When the absolute value of τ statistic is more than the absolute critical value of τ suggested by Dicky and Fuller, the stationary condition of time series cannot be denied and the time series is static. However, when the absolute value of τ statistic is less than the absolute critical value, null hypothesis regarding the existence of unit root is accepted and hence the time series possesses random walk process and therefore is not static. In addition, in order to test the stationary status of a time series, Dicky and Fuller (1979) extracted the limiting distribution of τ statistic based on some models that estimate the above equations by considering both intercept and process, intercept without process, and without any intercept or process.

Normal Dicky-Fuller unit root test that was mentioned earlier is valid if only there is a first-order autoregressive process. When this assumption is not applicable and time series is correlated at higher intervals (i.e. it has p th-order autoregressive process) ε_t interval white noise is rejected. When there is autocorrelation among intervals, Dicky-Fuller test no longer can be used for stationary testing. Because limiting distribution and critical values are correspond to Dicky-Fuller test. ADF test provides a parametric correction for higher-order correlation and assumes time series X follows a $AR(p)$ process and then adds differential components with lag P of dependent variable Y to the right side of the equation:

$$Y_{t-1} + \varepsilon_t \Delta Y_{t-1} + \sum_{i=1}^p \beta Y_t = \delta \Delta$$

Afterwards, this generalized correction will be used for stationary testing. Dicky and Fuller (1981) realized a very important matter and that is the limiting distribution of statistic for stationary testing depends on the first differential intervals of ADF regression. Three criteria including Akaik (AIC), Schwartz- Baizian (SBC), and Hanan-Quinn (HQ) as well as criteria with augmented values of these three criteria determine the number of lagged, differential components (number of optimal lags) to remove successive correlation in residuals.

Philips-Perron unit root test

Philips and Perron suggested a statistic based on the limiting distribution of Dicky-Fuller's different statistics, however, they ignored assumption on alike and separate ε_t intervals. Philips and Perron indicated that when ε_t intervals are not distributed similarly and separately, statistic has a limiting distribution as follows:

$$\lim_{n \rightarrow \infty} \frac{\sum_{t=1}^n E(\varepsilon_t^2)}{n} = \sigma_\varepsilon^2$$

$$\sigma^2 = \lim_{n \rightarrow \infty} \frac{\sum_{t=1}^n E(\varepsilon_t^2)}{n}$$

When ε_t intervals are distributed similarly and separately, σ_ε^2 and σ^2 are equal and Philips and Perron's results are similar to Dicky and Fuller's results. But usually they are not equal and tests that have been done through τ statistic are not valid enough (Noforesti, 1999: 50).

Results achieved by Philips and Perron's unit root test for the model variables are listed as follows [Table 2].

Table 2: Philips and Perron test

Result	Significance level	Statistic	variable
Stationary	0/000	11/42	Δa
Stationary	0/004	-4/67	Δq
Non-stationary	0/78	-1/55	H
Non-stationary	0/84	-1/39	π
Non-stationary	0/26	-2/65	R
Non-stationary	0/10	-3/17	N
Non-stationary	0/12	-3/09	P
Non-stationary	0/73	-1/67	C
Non-stationary	0/59	-1/96	I
Non-stationary	0/07	-3/42	Ci
Non-stationary	0/99	0/05	Fe
Non-stationary	0/17	-2/90	D
Non-stationary	0/67	-1/79	CCI

Null hypothesis of Philips-Perron's test is based on the non-stationary status of variables and they can be considered as follows:

H0: the variable is not stationary.

H1: the variable is stationary.

Significance level should be less than 0.05 to reject the null hypothesis.

Since most of the variables are non-stationary, we should repeat stationary test with a single differential.

Table 3: Philips-Perron's test with a single differential

Result	Significance level	Statistic	Variable
Stationary	0/006	-2/84	H
Stationary	0/000	-4/02	π
Stationary	0/000	-5/27	R
Stationary	0/000	-8/23	N
Stationary	0/000	-7/87	P
Stationary	0/000	-4/05	C
Stationary	0/000	-4/58	I
Stationary	0/000	-8/009	Ci
Stationary	0/001	-3/14	Fe
Stationary	0/000	-6/42	D
Stationary	0/000	-6/41	CCI

Since most of the variables are static after one differential, co-integration test should be done.

Co-integration test

It is said that if a time series has been d times differenced to be static, it possesses d unit roots and it would be total of d or I(d). When we have two time series (x_t and y_t) which are both I(d), normally each linear combination of x_t and y_t are I(d) as well. However, when we have constant coefficients such as α and β , total disturbing regression regarding x_t and y_t :

$$x_t - \beta u_t = y_t - \alpha$$

Has co-integration order less than d, for example I(d - b) is assumed ($b > 0$). Angel and Granger (1987) believe co-integrations x_t and y_t have (d, b) order. Therefore, two time series namely x_t and y_t have b and d-order co-integration which means CI(d, b). If co-integration is equal to I(d), there will be $b > 0$. Given the above definition, when x_t and y_t have both I(1) co-integration and $u_t \sim I(0)$, both time series have CI(1, 1) co-integration order; this definition also applies to more than two time series (Angel and Granger, 1987). When error-level of regression equation is I(0) (i.e. stationary), common econometric methods and data of time series can be used to estimate parameters and t and F statistics (Noforesti, 1998).

Results of Johansen co-integration test are listed in [Table 4] below:

Table 4: Results of Johansen co-integration test

Johansen co-integration test			
Result	Significance level	statistic TRACE	No. of relations
Rejected	0/000	153/32	No relation
Rejected	0/04	105/25	Maximum one relation
Approved	0/70	64/12	Maximum two relations
Approved	0/06	29/24	Maximum three relations

Null and alternative hypotheses of this test could be considered as follows:

H0: the variables are not co-integrated.

H1: the variables are co-integrated.

Significance level should be below 0.05 to reject the null hypothesis.

Since the model's co-integration is approved, it can be estimated at the level.

Correlation between the variables

Pearson correlation coefficient: Pearson correlation coefficient which is also called moment correlation coefficient or zero-order correlation coefficient is introduced by Sir Karl Pearson. This coefficient is being used for determining the intensity of a relationship, type or direction of the relation between two distance and relative variables or one distance and one relative variable. In fact it parametrically correspond to Spearman correlation coefficient. Some computational methods can be applied to calculate this coefficient.

In this paper, the following formula is being used:

$$r = \frac{n(\sum xy) - \sum x \sum y}{\sqrt{[n(\sum x^2) - (\sum x)^2][n(\sum y^2) - (\sum y)^2]}}$$

Pearson correlation coefficient varies from -1 to 1. $r = 1$ means there is a completely direct relationship between two variables; direct or positive relationship indicates whenever one of the variables increases (or decreases), the other one increases (or decreases) as well. $r = -1$ suggests a completely inverse relationship between two variables. Inverse or negative relationship suggests whenever a variable increases, the other one decreases and vice versa.

Before the estimation of correlation vector, model variables might be appropriate. Correlation indicates the linear of model components. When Pearson correlation is higher than 0.7 and is significant, there is a possibility of linear in the model. Through Pearson correlation method, the correlation among variables are achieved and listed in the [Table 5] below.

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Table 5: Pearson correlation between variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	1.000000																			
2	0.600000	1.000000																		
3	-0.700000	-0.400000	1.000000																	
4	0.400000	0.200000	-0.200000	1.000000																
5	0.500000	0.300000	-0.300000	0.400000	1.000000															
6	0.700000	0.500000	-0.500000	0.600000	0.400000	1.000000														
7	0.800000	0.600000	-0.600000	0.700000	0.500000	0.400000	1.000000													
8	0.900000	0.700000	-0.700000	0.800000	0.600000	0.500000	0.400000	1.000000												
9	0.950000	0.750000	-0.750000	0.850000	0.650000	0.550000	0.450000	0.350000	1.000000											
10	0.980000	0.780000	-0.780000	0.880000	0.680000	0.580000	0.480000	0.380000	0.280000	1.000000										
11	0.990000	0.790000	-0.790000	0.890000	0.690000	0.590000	0.490000	0.390000	0.290000	0.190000	1.000000									
12	0.995000	0.795000	-0.795000	0.895000	0.695000	0.595000	0.495000	0.395000	0.295000	0.195000	0.095000	1.000000								
13	0.998000	0.798000	-0.798000	0.898000	0.698000	0.598000	0.498000	0.398000	0.298000	0.198000	0.098000	0.008000	1.000000							
14	0.999000	0.799000	-0.799000	0.899000	0.699000	0.599000	0.499000	0.399000	0.299000	0.199000	0.099000	0.009000	0.000000	1.000000						
15	0.999500	0.799500	-0.799500	0.899500	0.699500	0.599500	0.499500	0.399500	0.299500	0.199500	0.099500	0.009500	0.000500	0.000000	1.000000					
16	0.999800	0.799800	-0.799800	0.899800	0.699800	0.599800	0.499800	0.399800	0.299800	0.199800	0.099800	0.009800	0.000800	0.000000	0.000000	1.000000				
17	0.999900	0.799900	-0.799900	0.899900	0.699900	0.599900	0.499900	0.399900	0.299900	0.199900	0.099900	0.009900	0.000900	0.000000	0.000000	0.000000	1.000000			
18	0.999950	0.799950	-0.799950	0.899950	0.699950	0.599950	0.499950	0.399950	0.299950	0.199950	0.099950	0.009950	0.000950	0.000000	0.000000	0.000000	0.000000	1.000000		
19	0.999980	0.799980	-0.799980	0.899980	0.699980	0.599980	0.499980	0.399980	0.299980	0.199980	0.099980	0.009980	0.000980	0.000000	0.000000	0.000000	0.000000	0.000000	1.000000	
20	0.999990	0.799990	-0.799990	0.899990	0.699990	0.599990	0.499990	0.399990	0.299990	0.199990	0.099990	0.009990	0.000990	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	1.000000

Correlation coefficient is in row 1 and significance of correlation is in row 2. When the number in row 2 is less than 0.05, correlation is significant.

All correlations of above table are below 0.7 and the possibility of linear in model is minimal.

Model estimation

The following regression will be estimated:

$$p_t = \alpha^p - \beta_{a,0}^p \Delta a_t - \beta_{h,0}^p h_t + \sum_{j=1}^M \beta_{x,j}^p x_{t-j} + \varepsilon_t^p$$

The model estimation is summarized in [Table 6] below:

Table 6: the impact of different variables on commodity price shocks

Significance	t-statistic	Effect	Variable
***	3/15	0/56	Commodity price shock of prior period
---	-0/52	-0/08	Commodity price shock of two prior periods
---	-1/43	-3/78	Intercept
**	-2/18	-0/47	Growth in labor productivity
---	0/99	0/14	Capital
*	-1/82	-1/05	Investment level

---	-0/26	-0/04	Employment rate
---	-0/88	-0/62	Inflation rate
---	0/76	3/72	Nominal interest rate
**	-2/36	-0/36	The rate of export to import
***	3/04	8/78	Food and energy price index
---	1/59	0/39	Continuous commodity index

***: significant with the possibility more than 99%

** : significant with the possibility more than 95%

*: significant with the possibility more than 90%

---: not significant

Significance test of research variables

To test the significance of independent variable coefficients of both models, t-statistic was employed. The null hypothesis of t-test is as follows:

$$\begin{cases} H_0 : \beta_1 = 0 \\ H_1 : \beta_1 \neq 0 \end{cases}$$

Where the following statistic validates it:

$$T = \frac{\hat{\beta}_1 - \beta_1}{SE(\hat{\beta}_1)} \sim t_{\frac{\alpha}{2}, N-k}$$

To whether approve or reject the null hypothesis, T statistic will be compared to t (in the table) with N-K degree of freedom and at a 95-percent significance level. When the absolute value of T is more than t in

$$|T| > t_{\frac{\alpha}{2}, N-k}$$

the table (), the numerical value of the test function is in the critical area and H₀ is rejected. In this case, β_1 at a 95-percent significance level will be significant which indicates the relationship between independent and dependent variable.

Model significance test

F-statistic is used for the model significance test. The null hypothesis of F test is as follows:

$$\begin{cases} H_0 : \beta_1 = \beta_2 = \dots = \beta_k = 0 \\ H_1 : \beta_1 \neq \beta_2 \neq \dots \neq \beta_k \neq 0 \end{cases}$$

The following

statistic validates it:

$$F = \frac{ESS/(K-1)}{RSS/(N-k)}$$

To decide whether the H₀ is approved or rejected, F statistic will be compared to F (in the table) with N-K and K-1 degree of freedom and at a 5-percent error level (α). When the F is more than F in the table (

$F > F_{\alpha(K-1, N-K)}$), the numerical value of the test function is in the critical area and H₀ is rejected. In this case, at a 95-percent significance level, the model will be significant overall. When the value of F is less the value of F in the table, null hypothesis is accepted and the significance of model will be rejected at 95-percent significance level.

The main details of estimation are listed below:

Table 7: Main characteristics of the estimation

Result	Value	Characteristic
Model explains dependent variable properly	0/97	The coefficient of determination
Goodness of fit	52/21	F-statistic

CONCLUSION

Regarding the estimation and explanations it can be concluded that:

- Commodity price shocks of the prior period have a positive and significant effect on commodity price shocks of the current period.
- Growth in labor productivity influences commodity price shock in a negative and significant manner (increase in labor productivity equals decrease in commodity price shocks).
- Investment level has a significant, negative effect on commodity price shocks (when investment level enhances, commodity price shocks falls).
- Increased export to import leads to a decrease in commodity price shocks (export to import rate has a significantly negative influence on commodity price shocks).
- Food and energy price index has a significant, positive impact on commodity price shocks.

Suggestions

Given the results, following suggestions for decreasing the probability of price shock in Iran are offered:

- Methods designed for enhancing labor productivity should be studied because by enhancing it, the possibility of commodity price shocks will lessen.
- Increasing exports and reducing imports should be placed on the agenda of Iran's economic ministries; according to the research results, increased exports leads to decreased commodity price shocks.
- We recommend statesmen and economic decision-makers to consider solutions for decreasing inflation rate especially in food and energy sector, because by decreasing inflation rate in a long term, the possibility of commodity price shocks will be lessened.

CONFLICT OF INTEREST

There is no conflict of interest

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None

REFERENCES

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| <p>[1] Kermani M. et al. [2005] Factors affecting Iran's real exchange rate, economic research.</p> <p>[2] Tayebi SK, Nasrolollahi Kh. [2002] Rate of key variables in explaining Iran's long-term equilibrium real exchange rate behavior, <i>Journal of Economic Research</i>.</p> <p>[3] Matthias Gubler, Matthias S. [2013] Hertweck Commodity price shocks and the business cycle:</p> | <p>Structural evidence for the U.S. <i>Journal of International Money and Finance</i>. 337 -324.</p> <p>[4] Central bank of Islamic Republic of Iran. [1987-2014] economic indicators.</p> <p>[5] Rahimi Broujerdi A. [1997] currency and non-oil exports, Monetary and Banking Research Institute.</p> <p>[6] Jafari Samimi A. [2008] Simple, econometric method, Mazandaran University Publication.</p> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Attachments and appendices

CCI	INV	RPI	ffi	EMP	OUT	HOU	IMP	EXp	CONn	gov	ENE	PPI	Foo	cpi	pop	
TM.VAL.M	NE.GDI.FP	NE.CON.T	BX.KLT.DI	SL.EMP.M	AG.PRD.CI	TAX.DU	BM.GSR.MR	TX.VAL.FC	NE.CON.G	GAG.PRD.C	TX.QTY.MI	TX.VAL.MI	AG.PRD.FI	FP.CPI.T	EG.ELC.A	year
78.94391	11.95929	5.34E+10	-3.1E+08	3.2	12193218	121	5540406421	3.28785	1.66E+10	47.2	65.30314	42.03916	46.59	1.725194	91.07548	1987
69.75735	14.09115	5.36E+10	60540000	4.2	12116749	121	5513944960	6.303123	1.65E+10	45.55	68.54613	37.78091	45.21	2.219818	91.57548	1988
88.43296	14.87563	5.45E+10	-1.9E+07	3.5	10786652	121	5275353324	3.81605	1.58E+10	45.04	78.97249	46.14923	45.95	2.715939	93.03774	
120.5366	15.54434	5.63E+10	-3.6E+08	2.6	13683863	121	5482343665	2.59425	1.64E+10	55.11	82.21548	68.10725	54.06	2.923102	93.53774	
165.6474	23.03117	6.12E+10	22590000	1.4	14447266	121	5849532899	3.500157	1.75E+10	56.13	92.64183	65.83524	55.03	3.423788	95	
153.0479	20.30426	6.29E+10	8500000	4.4	15810824	121	5797732502	3.432709	1.74E+10	62.98	95.88482	70.09349	62.13	4.30739	95.5	
126.8297	11.81956	6.67E+10	2.08E+08	3.7	16287213	121	6915767430	6.447982	2.07E+10	66.61	106.3112	63.7855	65.72	5.22067	95.6	
82.96837	10.60729	6.75E+10	2000000	3.5	16691094	121	6980799823	3.960909	2.09E+10	68.76	109.5542	68.56236	68.23	6.862415	96.1	
99.88488	10.53373	6.62E+10	17000000	3.2	17031706	121	6776821217	2.739109	2.03E+10	70.35	119.9805	63.88531	69.29	10.27001	96.2	
117.096	15.12768	6.76E+10	26000000	4	16082847	121	6671858950	3.645016	2E+10	74.89	123.2235	77.91155	73.08	13.24188	96.7	
102.1442	18.24484	6.93E+10	53000000	7	15822990	121	6425496425	3.577568	1.93E+10	76.2	133.6499	63.95838	75.23	15.53925	96.8	
103.058	19.18443	7.36E+10	24000000	6.3	18979267	213	6683327135	6.592841	2E+10	80.58	136.8929	45.64529	78.58	18.31551	97.3	
95.86991	18.04645	7.42E+10	35000000	6.1	14186048	344	6247839240	4.105768	1.87E+10	81.68	147.3192	73.17582	80.28	21.99156	97.4	
100	17.55549	8.03E+10	39000000	5.8	12873964	344	6998813971	2.883968	2.1E+10	76.49	100	100	77.84	25.17523	97.9	
120.2259	19.2068	8.36E+10	4.08E+08	6.6	14946548	344	7179148816	3.789875	2.15E+10	81.56	99.74774	89.38724	82.42	28.01355	95.2	
148.3451	17.70028	9.18E+10	3.52E+09	6.7	19861000	344	7337740136	3.722427	2.2E+10	91.92	109.1094	98.25324	89.81	32.02955	95.7	
178.4286	17.97479	9.58E+10	2.88E+09	6	20941778	344	7382475039	4.218373	2.21E+10	95.13	114.3356	117.4362	93.47	37.30418	96.1	
230.0763	19.00028	1.03E+11	3.04E+09	5.8	21986351	344	7478504483	3.053767	2.24E+10	93.67	110.2347	145.0886	94.33	42.81084	96.6	
288.1062	17.9028	1.1E+11	2.89E+09	5.5	21906732	344	8348988744	3.510299	2.5E+10	103.83	108.9097	195.734	102.99	48.56167	97	
293.366	15.67161	1.17E+11	2.32E+09	6.3	22407082	344	8970068213	4.251745	2.69E+10	102.5	124.7977	267.9704	102.68	54.35972	97.5	
323.3703	15.5136	1.25E+11	2.02E+09	6.4	24025766	344	8581649488	4.708277	2.57E+10	108.04	130.9044	308.7547	107.2	63.71668	97.9	
413.0163	13.28241	1.32E+11	1.98E+09	5.7	13475497	344	9202727935	5.449723	2.76E+10	99.03	124.7412	395.5183	99.13	79.99619	98.4	
365.29	13.12439	1.4E+11	2.98E+09	5.5	20835765	344	8814309206	5.906255	2.64E+10	107.1	127.3016	274.2963	107.04	90.79589	98.3	
470.6001	10.8932	1.47E+11	3.65E+09	5.2	22246967	344	9435387665	6.179093	2.83E+10	110.69	132.5122	352.5384	107.42	100	98.4	
444.3805	10.73519	1.55E+11	4.28E+09	6	20695843	344	9046968933	3.671056	2.71E+10	111.19	131.75	459.3062	108.53	120.6283	99.5	
410.7929	8.504	1.62E+11	4.66E+09	6.1	22010000	344	9468047358	3.943895	2.9E+10	115.65	103.4986	361.8776	112.34	153.6291	100	
352.5687	8.345988	1.7E+11	3.05E+09	6.4	22650100	344	9279628607	1.435858	2.78E+10	116.84	83.45675	285.3266	113.29	213.9536	101	
318.9811	6.114797	1.77E+11	3.43E+09	5.9	23964257	344	9700707031	1.708696	2.97E+10	121.3	55.20532	187.898	117.1	250.8293	101.2	

ARTICLE

FROM THE NATURAL CREATIVITY TO THE INFLUENCE OF EDUCATIONAL SPACES ON TRAINING CREATIVE CHILDREN

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ABSTRACT

There is a certain extent of creativity in all human beings at their birth. Children have the utmost ability in acquiring creativity and that's why it is significant to maintain and increase creativity in them; a subject that must be adverted and provided with the proper grounds and areas. Between the ages 2 and 5, children have the highest level of creativity. One way to maintain this level of creativity is designing the educational areas by the attitude of promoting their creativity. That is why the architecture of the educational spaces, kindergartens, day care centers, and elementary schools in particular, has a key role in growing the children's creativity. In the present essay, we study the architectural ideas and offer some appropriate solutions to design the spaces in order to promote children's creativity in the educational places. The found results demonstrate that designing the educational spaces matching children's mentality, open and flexible spaces for their playing, using festive stimulant colors, and an architecture corresponding to their age have an undeniable influence in increasing the creativity in children. We used a descriptive-analytic method in the present research and followed the library method in gathering the data through the valid sources and essays.

INTRODUCTION

Childhood is the beginning of training most of man's abilities. Training of imagination power and creativity also starts in childhood. All humans possess some creative talents in their childhood. However, not being in the proper atmosphere, ignoring these abilities, and not strengthening them hinder their development and appearance [1]. From Freud's point of view, the creativity sources must be found in the childhood experiences [2]. In the recent years, numerous researches have been done and among the various influential factors in growing children's creativity, educational methods; children's emotional-cognitive aspects; and training issues have been examined, but the effect of the architectural quality in growing creativity has not been sufficiently attended. The studies indicate that the creative potentials are founded in childhood and the best time to develop imagination and creativity is between the ages 2 and 10 [3]. No doubt that one the biggest obsessions of parents today is to raise clever and creative kids; talented children who can obtain the higher education levels as well as possible. In this regard, Clifford brought up some serious discussions and pointed that creativity has four ultra-cognitive elements that can be promoted through training and education. The following studies indicated that creativity as a combination of its elements (fluidity, flexibility, and innovation) can change and improve through training especially innovation that proved to have a significant mutation (cited from Glifford, 1967). "Children's creativity depends on their imagination power" and imagination is the most significant factor in the growth of creativity. Researches on the relation between playing and motivating the creativity in children have demonstrated that "There is a direct relation between the amount of their playing and promoting creativity in them" [4]. Playing dose not rather need to be learned; however, it makes children to learn a lot of concepts and interactions. Children's power of imagination can be perfectly trained while playing games. Playing can also remarkably affect the growth of intelligence in children [5]. Moreover, it can provide opportunities to cooperate in team works. Another research indicates that curiosity is affective in the process of creativity and the creative people are usually curious [4]. As a result, the educational space that we design for children must provoke their imagination; increase their tendency to play; motivate their curiosity; and consequently promote their creativity.

Background of the Study

Vast and various researches have been carried out on the topic of educational spaces and influential factors in growing creativity. For instance, the book "A Reflection on the ABCs of Designing in Educational Spaces" written by NargesKhasrogerdi and Habibeh Mokaram can be referred. In this book,

KEY WORDS

natural creativity,
children, creative
spaces, training,
architectural ideas

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they examine the influential elements in designing an educational space and their influence on the students' imagination, motivation, and learning. Also we can mention the essay "The Architectural Solutions in Designing the Children's Space Based on a Creativity-promoting Approach" written by NargesForoushi that is a comprehensive example on the subject of the present essay.

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Methodology

The method applied in the present research is descriptive-analytic and we followed the library method to gather the data through the valid sources, essays, documents, and recorded works. It is a practical essay with the purpose of designing a creative educational environment for children and students and through examining sample schools in the world, it undertakes to offer solutions to design creative schools.

Questions of the Study

In order to reach the goal of educational space effectiveness in training creative children, it seems necessary to answer the following questions:

1. Is creativity inherent or acquisitive?
2. What is the best age to train creativity?
3. Are the architecture, furniture and appliance of educational spaces effective in training creative children?

Hypotheses of the study

It seems that creativity, in the first place, is inherent and inborn and all humans possess this divine gift. However, it does not mean that all humans would be intelligent and creative individuals in their adulthood. It seems that the best age to grow and maintain creativity in human is the childhood. It seems that one of the solutions to maintain the childhood creativity is through the architecturally designed spaces for educating children.

Significance of the Study

Regarding the fact that the educational spaces in Iran lack a proper design and environment and places with a quite different function like residential utility are used for education, it is absolutely necessary to do such researches and achieve the essentials and principles of architecture and designing the educational spaces especially for children in order to fortify their creativity.

Statement of the Problem

Learning is a part of a human being's life and school plays a major role in process of learning. In a school, not only the classrooms are significant as the learning and teaching spaces, but also the school spaces as a whole including the corridors, the entrances, the group spaces, the campus, etc. and moreover the details such as color, light, the texture and the building materials are very important in learning process. The proper environmental conditions can be effective in proper learning (5).

Findings of the study

Definition of Creativity

Taking a look at the valid sources on creativity, innovation, and creative thinking indicates that the term originates from the human's type and method of thinking. In fact, a creative individual is someone who has a searching and creative mind. About the concept "creativity" various and even sometimes opposite definitions have been offered, but there has been a common consensus on the following definition: "Creativity is the individual's ability to produce ideas, hypotheses, insights, the new and innovative things or to reconstruct the sciences and other grounds in way that it is considered, by the experts, to be original and valuable scientifically, aesthetically technologically, and sociologically (Warton, 1989). Creative individual is usually known as a person who can figure out various innovative and logical solutions for each problem. Examples of creativity can be found in all parts of life especially in the children's drawings [6].

Is creativity inherent or acquisitive?

The learning patterns of the brain begin from the fetal period and at birth based on the life viewpoints. The individual's way of reacting to and compatibility with the environment specifies the lifestyle and the learning style of the brain. Many people believe that inheritance shapes the learning scope, but this is a misleading belief. It is obvious that the environment more than any other factor affects the growth of the brain. School is one of the major centers that can alter the students' learning patterns. Recently, most of the scientists studying the influence of the environment and inheritance in brain growth have acknowledged that the contribution of the inheritance and that of the environment are equally 50 percent [5]. In William James's viewpoint, all of us possess the creative talent, but unfortunately during our lives and in the course of education and training we learn to be uncreative. In other words, the learning environments in general including home, school, and the society accustoms us to the convergent thinking. Through education and training, we can teach our children to think in some unusual ways and to examine the problems and reach to proper solutions via divergent thinking [1]. According to Plato, the key task of the education system and schools is to turn the humans' "limited beings" into "unlimited becoming". Socrates considers the education aim to be creating needs to know, not offering the knowledge. Due to these ideas, it can be said that all children potentially possess the creative talent at their birth. This potential talent can continuously bloom in case it receives appropriate training. Otherwise, withheld and replaced by the other talents, the rhythm of creativity growth, thus, slows down at the age of 6 and stops by the age of 9. School's comparative programs are the most important factor in causing creativity backwardness. At schools, classic and methodical abilities like mathematics, dictation, and logical thinking are taught, but non-classical and non-methodical abilities like creativity are ignored [6]. Therefore, we can say that creativity is donated to all humans inherently, but maintaining this inborn talent is acquisitive and man's responsibility.

The influence of the educational environment on training creative children

Children are the most sensitive and the most influential age group. In the most sensitive and the most important years of their lifetime, when the basis of their personality, mental, physical, and social life is being shaped, the children need to experience the social life in their own specific scale. It requires a juvenile and intimate space; a space far from the hubbub of the adult world, a world full of joy, with beautiful colors where the child is given the opportunity to express new ideas and to show their talents; a space that provides the suitable ground for children's creativity [5]. And that is why the educational environment and its designing matters [Table 1]. A classroom must have capabilities such as compatibility with the needed changes; making room; increasing the students' creativity and their co-operating level; and external access [7].

Table 1: The needed spaces for designing an environment for children

The designed environment for children must have the following spaces:	
1	Natural spaces: like trees, water, and living creatures that form the most essential and the most important space for children.
2	Open spaces: Vast spaces where children can run as much as they like to discharge their internal energy. Playing causes to increase the feelings of co-operation, attachment, power-display, skillfulness, and self-confidence. Playing causes relation and interaction between the child and their internal and external world.
3	Communicative spaces: the paths and roads used to be the main playgrounds of children before the appearance of the cars and vehicles. Paths are the spaces where children meet each other and are a network to join the various spaces.
4	Spaces for adventure: These are spaces full of challenges and complications to provoke the imagination and visualization power in children.
5	Secret spaces: They grow the sense of independence in children.
6	Playing structures: These spaces are designed in places where playing games is important. They are known as playing spaces.

Source (5)

The emphasis is added

How to design a creative environment

In general, in order to grow the creativity beside the process of learning it is necessary to apply active and exploratory teaching methods which are student's activity-based. In fact, each of the existing

classrooms can be arranged in a way that they can provide a space needed for the appearance of students' creativity.

The chairs and the tables can be arranged according to the subject of each class. For example, they can be set in a circular form for class discussions or in a way to fit team works or group works containing 2 or 3 individuals [5]. The key point is having flexibility in utilizing the educational spaces. Findings of the studies carried out by Hersej demonstrate that when the classrooms are designed based on the idea of being flexible to meet the course needs, the students' understanding power will increase and it flourishes innovation and creativity in them. Besides, changing the educational methods and goals has to be accompanied by appropriate changes in educational spaces [8].

The common educational system

Iranian Schools usually lack a proper space and designing and it hinders the growth of creativity in children. Iranian schools are whether inside buildings built with a quite different functionality like residential function or if they are built as a school, they have very simple and boring plans lacking any design appropriate for children. The plans of Iranian schools consist of separate classrooms set at both sides of a corridor.

In such a system, the classrooms are, in fact, a rectangular space inside which the rows of chairs and the platform of the teacher in front of them produce a kind of unidirectional space arrangement [5]. The furniture is set in a linear way and there is no proportion between the back and front furniture. The possibility to move the furniture for group activities is very limited and space diversity cannot be made by rearranging or moving the furniture. The class atmosphere is so formal that prevents the students to be active and dynamic which is, in its own turn, a necessity for manifestation and development of creativity [8]. Playing games, exercise, practical experiences, and challenging activities are the main resources of learning; however, the Iranian schools are still being designed against the students' learning patterns. For instance, although the swimming pools are among the stimulant and challenging spaces for primary and middle school children, they are hardly ever available for primary and middle schools. In Iranian schools, it is not even possible for the students to grow a plant in a vase [5].

Theory

Creativity has gone under essential changes in the course of history. In this regard, the 1950s is a turning point in researches on creativity. In this decade, Glifford[1967], stressing on the limitations of IQ tests to measure and assess human talents and bringing up the divergent thinking, made a new area for researches on creativity. Earlier, it was assumed that creativity was limited only to a few specific people and it could not be trained either. This theory confined most of the studies on creativity. But, today based on Glifford and many other theorists' ideas, creativity is believed to be capable of training and education and possessed by any individual according to their abilities and capacities.

Examining random samples from all over the world

The design of most of the European schools is nothing like the fixed and formal framework of Iranian schools and it is mainly based on maintaining the peace and safety and increasing the power of discussion, co-operation, and imagination in pupils.

The kindergarten interior designs in Serbia

The architect: IDEST DOO In the interior design of this kindergarten, especially in corridors, communicative spaces, and bathrooms, happy bright and vivid colors are used to create peace, joy, and vivacity in children and consequently to increase their learning power. Moreover, it can be obviously seen that the architect has done his best to observe one of the primary principles of architecture that is using the transparent natural light of external area in order to enhance the efficiency. There are many elements that contribute to activation and growth of kid's imagination power such as an open vast space with round light and easily moved furniture; arrangements suitable for team works that motivates co-operation; appropriate shelves in the classroom; beautiful and creative shapes; and much more elements that provoke activity and creativity in children [The Fig. 1-6].



Fig. 1-6: the interior design of a kindergarten in Serbia, source: writer

The Ordrup School

Design concept: peace and reception, discussion and co-operation, safety and presence Based on these three main elements of learning, in this school the training spaces are designed as colorful centers where students can have group discussions; they can easily and naturally move and displace their desks to fit team work and creative games; they can make some private learning room for themselves where they think and review their tasks; and finally they can study or concentrate in the entertaining tubes. While researching, the designing team found that each individual has a unique way of learning different from those of the others. Therefore, they designed theOrdrup School based on this finding. It can be said that the form of Ordrup School follows operation although it is entertaining and beautiful [Fig. 7-12].

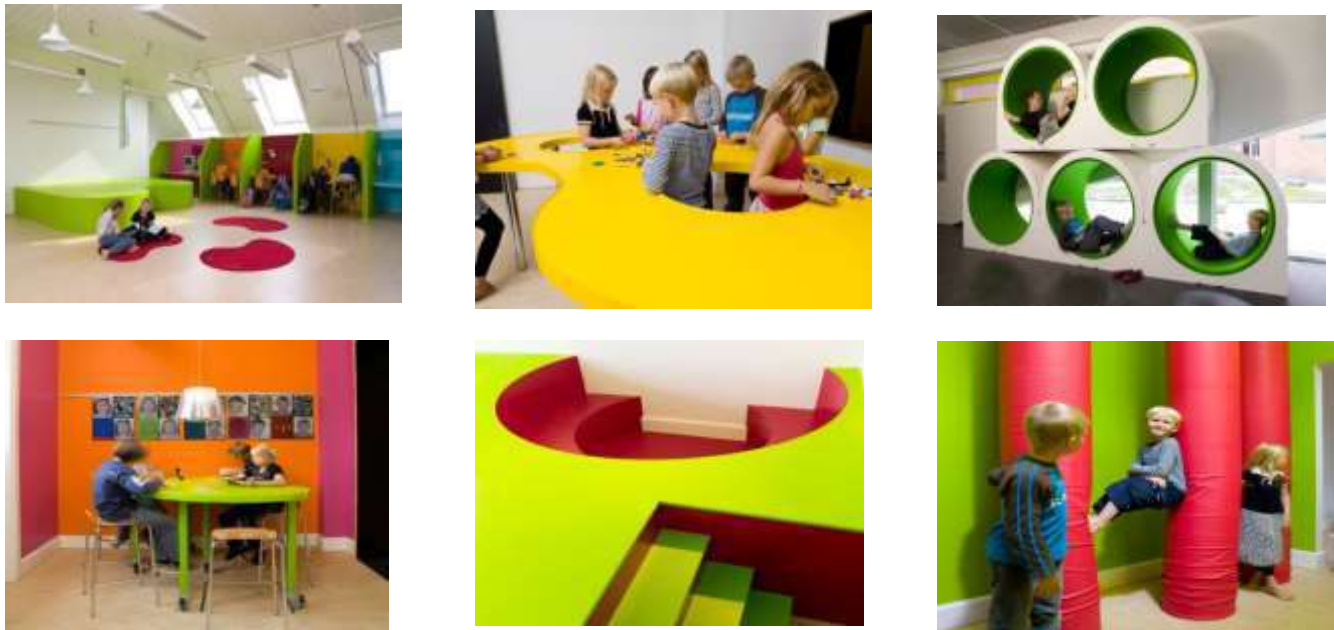


Fig. 7-12: the interior design of Ordurp School, source: writer

The impact of color and light on educational environments and on learning

The buildings assigned to the education and training of children must have the primary architectural principle of congruity between the color and light and the educational functionality of the building. Since it is not likely and possible to drastically redesign and rebuild the schools, the best starting point to improve the educational spaces is to revise some false beliefs about color and light in schools [5].

Color ology in educational spaces

Color, as an indispensable element in architecture, has a remarkable influence on the spirit and behavior of the users of a building and severely affects their mental and emotional states. Due to the children and teenagers' physical and spiritual conditions, the color of their educational spaces and equipment is of utmost importance because, from one hand, it can cause vivacity, exhilaration, mental peace, motivation, and effort in students and, thus, lead to an increase in the process of learning. And from the other hand, it can also pay the ground for the students' boredom, inactivation, nervousness, stress, and depression. The diversity of applied colors and their brightness and vivacity can amplify the children's learning power. Thus, it is recommended that in spaces designed for children education, bright colors such as yellow, purple, and orange be applied in the background of warm colors. We must notice that the influence of colors on the children's minds is not limited to the books, but they are highly impressed by the color of equipment and furniture in educational places (the color of walls and ceilings, corridors, school yard, windows, and all the learning assisting tools). That's why, today, in standard schools colors like yellow, red, and blue are remarkably used. Another point is the appropriateness of applied colors and the education level [5].

Light in educational spaces

Providing light in the training spaces increases students' learning power and their efficiency. Low light makes the students bored, weary, upset, careless and even depressed. Applying the natural sunlight is of utmost importance in the learning areas. The natural light can be provided through windows, doors, and skylights.

In the end, we can enumerate the advantages of sufficient and proper lighting in the training areas as follows:

1. Increasing the individual's accuracy and concentration (both teacher and student).

2. Increasing the tendency to work and to learn.
3. Protecting the eye health and decreasing the nerve tiredness.
4. Accomplishing the tasks more easily and accurately.
5. Causing variety, vivacity and liveliness in the training places besides space emphasis [5].

CONCLUSION

As it is already said b, in order to have a creative society in future, we need to train creative children now and it requires some necessary facilities. Having examined some schools from abroad and compared their design, arrangement, equipment, and furniture to those of Iranian contemporary schools and also studied library sources, we achieved some solutions to improve the Iranian schools' design. Our findings are summarized in the following table. We hope that through applying the present essay's findings, we can provide an attractive creative environment for Iranian students especially the young children [Table 2].

Table 2: Architectural Solutions to make a creative space, source: writer

Architectural Solutions to make a creative space	
Vertical training surfaces: By these surfaces we mean the writing and display surfaces.	Hanging up students' works and crafts on the walls Assigning some places on the walls for students' drawings Installing some suitable book shelves in the classrooms
Horizontal training surfaces	Flexibility of the desks, chairs, etc. Existence of a platform in the classroom for doing various individual or group activities Light chair that can be easily moved around
Setting visual stimuli in classroom	According to any subject, there must be training assisting tools such as compasses, atlases, maps, audio cassettes, dictionaries, encyclopedias, and toys available to the students
Variability of the space and its components	Defining the space by moving walls: Walls with metal panels covered by acoustic boards Using doors that fold to the sides or upward to combine or separate the inside and outside spaces and to integrate the open and closed spaces Providing small walls or separating elements that can be easily moved by children so that they can make the needed rooms themselves
	Defining the space by movable components (furniture): Movable light furniture, modular furniture, or the like Using the kind of furniture that can be used both for team works and as an individual desk suitable for one person only by doing some trivial changes: puzzle-like furniture
Group arrangement	An arrangement of chairs and desks that leaves enough room for students' activities Round tables for group activities
Mobility and dynamism in the yard	Using the natural elements such as water in the yard Using flower boxes that can be moved to specify the areas whenever needed Assigning some spaces for children's playing: playing sand, growing flowers and plants... Producing spaces for free classes (without walls) outdoors
Mobility and dynamism in the corridors	Making fractures or transformation in the corridors Making the corridor a space belonging to everybody Applying ceiling skylights Making notches in the corridor walls to encourage formation of friend circles

Space functionalism	The shape and size of the spaces has to be communication and team-work friendly Assigning one fixed classroom to the children and flexibility and multi-functionality of its space
Color ology	Applying bright and warm colors in the communicative spaces, salons, ... Paying attention to the color of desks, benches, walls and ceilings, corridors, school yard, windows, all the learning assisting tools, etc. based on the psychology of colors Appropriateness of colors and the education level of the students Using furniture with warm colors

CONFLICT OF INTEREST

There is no conflict of interest

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REFERENCES

- [1] Foroushi, arges, Nazanin Nasrollahi, Behzad Vasigh. [2013] The Architectural Solutions in Designing the Children's Space Based on a Creativity-promoting Approach, The National Conference of Architecture, Culture and Urban Management, Karaj, The center of scientific-practical education of Karaj municipality
- [2] Shariatmadari, Ali. [1965] Educational Psychology, Isfahan: Mashaal bookstore Publications, 2nd Ed.
- [3] Azamati, Hamidreza. [2008] Principles of designing the civil parks based on promoting children's creativity, PHD thesis, Architecture and Urbanism College, Iranian University of Science and Industry.
- [4] Shaffaei, Minu, Madani, Ramin. [2010] Essay: Principles of designing the educational spaces for children based on the creativity model, The Scientific Journal of Education Technology. 4(3).
- [5] Khosrogerdi, Narges, Mokaramdoost, Habibeh. [2011] A Reflection on the ABCs of Designing in Educational Spaces of Elementart Schools, Tehran: Tahan.
- [6] Craft, Thomas Fan. Zemkeh, Edvin. [2010] Discovering and Training the Talents, Tehran: Peidayesh
- [7] Kamelnia, Hamed. [2009] The Grammar of Designing Learning Spaces, Sobhan Noor Publications
- [8] Aghabeigikalaki, Maryam, Hamidreza Azamati, Amirreza Karimi Azari. [2015] The influential solutions to make the furniture in educational space flexible in order to increase the students' activity and creativity, The international conference on human, architecture, and urbanism, Tabriz, The center of architecture and urbanism studies

ARTICLE

THE RELATIONSHIP AND ROLE OF VERNACULAR ARCHITECTURE IN ACHIEVING AND MANIFESTING SUSTAINABLE ARCHITECTURE

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ABSTRACT

The energy crisis was one of the environmental problems in the last century that affected on many human activities. Architecture design faces to difficult challenge in high energy consumption as an effective factor. Therefore, the issue of environment protection, future generation's need and enjoying from energy bring a new concept as sustainability in various sciences such as architecture. Sustainable architecture is one of the discussions in our country that has recently been come on the topics and considered. Principles of sustainable architecture in many buildings and vernacular housing are relatively compliance. Vernacular architecture includes unique features that in addition to considering the issues of beauty and protection of environment, it should also be responsive to climate needs. The principles used in architecture include many sustainable architecture sciences that thereby it can be has effective steps towards achieving sustainable development. In the present study, sustainable and vernacular architectures are considered and then, the values of architecture principles are studied that lead to achieving sustainable architecture and finally, lead to sustainable development.

INTRODUCTION

Addressing sustainable architecture and tools of forming such an approach in architecture designing is necessary for deeper understanding of goals and recommendations of sustainability. On the other hand, solving environmental, cultural and social problems and tightly integration of this issue, lead us to vernacular architecture and the approach of sustainability in comparison and measure each other to extract its teachings for designing today architecture. In vernacular architecture, it was tried to use the minimum facilities and the easiest energies efficiently. Sustainability of many vernacular monuments is culturally and socially one of the values that is able to develop in architecture. Vernacular architecture is one important issue in the field of aesthetics and respect for nature. Although vernacular architecture has been changed by transformative phenomena through history, it can maintain its specific identity and can be representative of their customs and traditions [1]. Sustainability is a concept that is used much as amount of value of a method and is a repetitive process. But vernacular architecture met its time needs and repetition of that is pointless. In order to achieve sustainable architecture as one of the most important resource considering vernacular architecture experiences of Iran that was responsive to human needs in specific environmental, historical, and technical situations clearly. This statement is not for repeating the past framework, but it means getting principles and finding proper interpretations of them in the present era [2].

KEY WORDS

Vernacular architecture,
sustainable architecture,
sustainable architecture,
environment, housing

Research Hypothesis

Vernacular architecture has a significant role in achieving society to sustainable architecture and development.

Research Method

In this study, the research method is based on library studies that are based on collected documentations of sites, articles and books.

Theoretical basis

Sustainable architecture

The concept of sustainable architecture is more related to increasing quality and standard of life than preservation of life. The best concept of sustainable architecture for the architects is that they can build the artificial environment based on increasing the present quality of life and providing the future

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generations' needs. On the other hand sustainable development is consistent with the climate and the conditions inside the building is based on human welfare in this type of architecture and it also does not harm to the environment. By understanding geographic, cultural, religious conditions and by responding to the welfare, cultural and religious needs in every nation, we can have sustainable architecture. Sustainable architecture is in harmony with the climate and does not disturb the environment and this is an architecture that respects to human and its culture and environment. Buildings that are designed according to sustainable architecture, unlike fixed and old buildings were flexible and somewhat mobile. So that according to Richard Rogers «Buildings like birds that tease their feathers in winter, adapt themselves to new biological conditions and adjust their metabolism based on it. Thus, order of this sensitive form of designing establishes a successful relationship between the world of nature and the world of humans [3]. The history of sustainable architecture is more in Iran than the West and traditional architecture of Iran is one of the best sustainable architectures in the world. Traditional architecture of Iran presents particular interest in the proper and effective use of renewable energy in ancient times that in every climate these methods were different based on conditions of weather, culture and etc [4]. Discussion is a discussion that is also rooted in the past and is not a new discussion. Sustainability definition is found outside of the major global congress and includes not only building, but also includes all resources of the earth that should be encouraged. Sustainability is one of the admitted principles of architecture that should be considered in all architectural styles and in various times. Sustainability designing deals with creating durable and healthy spaces economically, socially and etc. The important principles of this design respect to natural systems. In this way, understanding ecological processes that their trace is clearly seen in vernacular architecture helps the process of sustainability [5].

Vernacular architecture

Vernacular architecture can be referred to any type of architecture that belongs to a specific location. This architecture can involve simple rural-urban buildings to large buildings and even historical monuments and wrongly, in the majority of cases vernacular architecture and rural architecture are considered as equivalent. One of the pioneers of the debate in the world is Amos Rapoport. He offers specific definition of vernacular architecture. Rapoport considers vernacular architecture as architecture that is placed against official, unknown and monumental architecture. In other words, it is simpler, popular and overall is architecture that is responsive to the needs of general public. He also argues that monumental architecture could have roots in the vernacular architecture. About half a century, vernacular architecture is a part of theoretical discussions and is part of empirical researches of architecture. At first this topic was called as the various names of unknown architecture, traditional architecture, public architecture, folk architecture and even as architecture without architect. Although this architecture has been changed by various phenomena, it can maintain its specific identity. Since ecology takes into account as a valid certificate of people of a country, it is representative of customs, moral and feelings, ideas and beliefs, verve and elegance, and their art. In the formation of vernacular architecture, some social and economic relationships in natural environment and cultural symbols are deftly reflected, so that at the same time, simplicity and arraying are manifested in them. Vernacular architecture that is realized far from specialties is responsible for responding to the needs of a community in relation to natural factors and spiritual aspirations of human beings, because by their participation is created in designing and implementing and draws inspiration from their daily life and it is established far from glaring and appearance-decorating. Therefore, vernacular architecture without having style and far from a specific model and form preserves improvisational characteristics. Accordingly, we find artifacts and vernacular architecture facing to unknown lands in a mysterious, familiar and understandable link [6].

Studying traditional methods to perceive sustainable strategies used in vernacular architecture should have a valuable contribution in researches which are fundamental and systematic and study the real performance of vernacular buildings and their technology and give us a proper understanding of how to update these methods for applying in today sustainable buildings. Developing this issue in the new buildings in order to evaluate how to use the past de-active techniques can lead to improve their performance, decrease energy consumption, decrease performing costs and adapting them to climate changes [7].

Principles of sustainable architecture

Table 1: Principles of sustainable architecture, Aminzadeh [2003]

1	Providing human needs without acquiring natural resources and facilities of posterities
2	Improving the quality of life and physical and mental well-being and social and economic justice
3	Making security and comforting in architectural spaces
4	Flexibility and adaption to the environmental conditions and changes in different seasons and different times
5	Rational use of land and accommodation of architecture form with the form of ground and the environment around it
6	Preventing air pollution and environment pollution and avoiding the use of pollutants
7	Using designing method in harmony with the environment and considering local patterns in designing and constructing
8	Reducing the consumption of non-renewable energy and sources and increasing use of renewable energies
9	Using materials and elements in harmony with the climate in order to reduce energy consumption and reduce pollution and recyclability of materials
10	Using the elements of nature and combining green spaces with residential spaces
11	The maximum use of light, heat, humidity, wind, natural ventilation and controlling them indoors

Preparing sustainability basis

1. The basic use of existing materials and local transportation means.
 2. Use of the resources that there are sufficiently in order to general and basic demands in a way that does not lead to destruction of environment.
 3. Independency on equipments that they are simply not available.
 4. Use of skills that can be developed and educated effectively in society.
 5. It can be achieved according to socio-economic and local-native context.
 6. Creating valuable results.
 7. Responding to the effects of local weather.
 8. Having the flexibility to meet local needs and habits [8].
- Sustainability with its main and contagious slogans that they are global and aim at preserving problem of the earth recommends local approaches to achieve realistic and workable solutions on the one hand and supporting the diversity is in nature on the other hand, and it considers the slogan "think, but act locally" [9].

Process of forming vernacular architecture

The first- the creation of architecture products spreads over particular temporal space that sometimes is renewed. It has starting point and the other point presents as a moment that design, developing and building actions are finished. It's not only because any building starts to change sensibly after ending its construction, but also it's because the real life of buildings start with human life within them and effectiveness of this life on the figure of building is essential that gradually leads to different transformations. This is more because presence of human in a building that is designed, developed and built for him, from the beginning of designing, developing until the end of construction is achieved virtually. The presence of human in building is impossible without his thought, interests and needs which are changeable during the time. Involvement of buildings to people who dwell in them is proposed as a fundamental principle.

The second- combining and effecting by nature along with impressionability and with respecting to it in all country take into account as the first features of vernacular architecture that can be accepted by all people as a basic principle. This is a principle that because of its effective concept, whether in the world of applications and reasoning or in the world of supernatural relationships and divine ideations is enforced without it being written. From the simplest forms derived from the combination of stones together to boastful of water, plant, light and the sun in order to sanctify buildings and show them as a symbol of life of that world is evidence of ruling the principles in man-made spaces.

The third- the distance between need determining and need providing, distance between imagination and realization of a space that can have more adaption to it, distance between moment of thinking about the ground, building and the moment of acquiring areas and objects are main characteristics of vernacular architecture.

The forth- reflecting the interests of people who building optimize architecture in shape, corners, decorates and in proportion of made figures is an issue that is so much overbearing which is indicator of ethnic culture and takes into account with that personal culture simultaneously. If ethnic culture is considered as the first factor of forming units and architectural collections, personal interests and insights can be nothing except variables in the field of that culture and this is where we can present two

characteristics that are in contrast and complement with each other: the first characteristic gives the units and collection of architecture integrity; and the second characteristic is maker of overbearing for identity of buildings and collections owners. In other words, people culture with its different aspects effects directly on colors and sizes, on building techniques and manners of space ordering, on how people enter and move and replace in the building, on outer form of made space and on way of the natural space replacing.

The fifth- during the process of forming a building, set of visual features made by tasty and intellectual delicacies and born by local customs and representative of history and culture of native people makes both city and buildings as a symbolic way of public wealth. What we can add to this category is in relation to the identities of individuals that is measured in an organic community in the body of improvisational architecture and is subtly woven [10].

Secrets of vernacular architecture durability

Identity and nature

In a chaos world of today, identity is an elusive secret. Today identity is mentioned more as humanity identity, artistic identity, architecture identity ... all due to the fact that "identity" is missing and all attempt to find it! In fact, identity is a concept that connects a work to its origin, root and source (Bork hart, 2002). From the perspective of traditional human, man is a creature of God and the world that is placed in it is the creations of God. Then, the origin of man and the universe is from a supernatural source. Therefore, a man to achieve his identity should be close to his cognatethat is nature [11]. The presence of man in nature, near to God and his origin has some symptoms. Its symptoms are signs of nature. Thus, man and his appearance like art and architecture as be more natural, he is more close to its identity.

Unity and harmony

The purpose of art is human environment and the world (which is made by man) benefiting of order which is manifestation of divine unity in the most direct way. It bright and refines the art of world, helps the soul to release it from the disturbing plurality of matters and return to boundless unity [12]. The purpose of Burkhardt can be got in vernacular architecture by intelligence. In vernacular architecture, all houses (while they are not alike) are in a unit order and create a coordinate and coherent collection.

Beauty

Vernacular architecture is beautiful and pleasant, because its maker thinks beautifully. Beauty of vernacular architecture is not in artistic skills. It means it deliberately did not want to make itself beautiful, but its beauty origins from its knowledge of the universe and cosmic; because by following what has been created at first, what he makes as his perceive from the universe be more sublime, his man-made artifact is more beautiful. Thus, the secret of beauty of vernacular architecture is hidden in the ratio of knowledge of universe. In the same proportion, anyone with any point of view that faces to it, unconsciously forced to admire it, but all viewers are not aware of the reason for all this beauty. To understand this concept, deep insight is needed [13]. Purposeful use of color make an order that in the absence of it, confusion is ruled in the viewer's mind and perceiving colors in art and architecture indicates intelligent awareness of quality and quantity integration. One of the main sources of this integration should be nature [14].

Maximum features of vernacular architecture

One way of understanding vernacular architecture is familiarity by empirical way. Dr. Mansour Falamaki studied three inseparable perspectives to empirical recognition: Creating a building regardless of direct and passive effectiveness from the environment, considering a comprehensive cultural environment or learning environment around the architect and architect's attention to the set of economic, official and productive relations of vernacular architecture environment according to this every tradition depends on its social and economic conditions, this case is used to organize solutions of meeting needs of every region. They arise among the communities that consider principles and have self-made architecture. For example, by specifying the characteristics of different parts of each site and aligning elected using of any point of building with the features of each site and also, aligning the materials used in buildings proper to climatic conditions and maximum enjoying that in order to create optimum conditions for users to local building in every point of the world is a respond to the problems such as structural problems. This architectural process is transmitted from one generation to other.

In general, vernacular architecture is derived from environmental features in order to meeting human needs. This architecture is affected by economic, cultural and climatic conditions and was performed by native architects to meet the needs of local communities. Cultural and social diversity and deference in climatic zones effect directly on form and technologies of local architectural constructions. In general, vernacular architecture includes conditions and features of every environment in relation to natural factors or human spiritual demands. The relationship between human's environment and natural environment is considered as the main key of vernacular architecture. This architecture contains all the houses, spaces and buildings that are made for man and these buildings that are made by owners or established by the community depend on environmental basis and available resources and benefit from all traditional technologies. All forms of vernacular architecture was built for meeting identified needs, a certain qualities of life, economy and life styles of cultures made them [15].

Importance of understanding climatic features of vernacular architecture

Projects in the field of architecture that was proposed after advent of industrial revolution and achieving fossil fuel by man, they had and have the least adaption to climatic conditions. Although technological advances resulted from industrial revolution lead to decrease effects of many conflicts and were a covering on weakness of projects of architecture climate in the present era, integration of architectural projects in all cities with different climate can be seen especially in some countries like Iran in this era. But the risk of decreasing fossil fuel and limitation of its supplying in the middle of 20th century cause to tendency of industrialized countries to nature and enjoying its forces in order to improve conditions of life that among them, considering to the aspects of energy consumption in buildings by the countries causes to invent types of climatic designing techniques. Of course without regard to vernacular architecture and enjoying its patterns, it was not possible.

Using the climatic techniques presented by experts of industrial countries without considering vernacular architecture does not have necessary efficiency. In addition, the experience of residence in Iran and brilliant history in the field of architecture consider necessary the attention to climatic techniques of vernacular architecture and using that with the modern method. In other words, the main identity of architecture is responding to the needs of man in place that has been developed by increasing experience of human during the history [16].

Principles of sustainable architecture in contrast to the native formed factors

The first principle: energy conservation

Every building should be designed and constructed so that its need to fossil fuel reduces to minimize.

The second principle: working with the climate

Buildings should be designed so that the use of climate and local energy sources can be possible.

Form and way of building placement and location of its interior spaces can be in a way so that cause to increase convenience level inside the building and at the same time cause to decrease fossil fuel consumption through the proper insulation of structures.

The third principle: reducing the use of new sources

Every building should be designed so that it can be minimize using new sources and create a source for making other structures at the end of its life.

The forth principle: respect to the users

Sustainable architecture respects to all people who use the building.

Form, plan, access, and ... should be formed all based on users' need and the way of users' usage and the maximum performance and flexibility can be seen in structure.

The fifth principle: respect to site

Each building should touch the ground in a quiet and light way. Forming textures along the ground, optimal use of natural resources and in general, a texture like the shape of environment can introduce the building as a part of nature.

The sixth principle: Holism

All sustainability principles need to participate in the holism process for building artificial surroundings [17].

The use of principles of vernacular architecture in line with the sustainable architecture

Although it is accepted that form, whether natural or social phenomena, belongs to the outside world and it has specific features or unique energy that can change anything into something else and if it is again accepted that man responded to his needs in providing made spaces by using forms, facilities and environmental limitations in the form of usages, in that case, it could be argued that vernacular architecture is applied at any point in history with considering the comprehensive physical and non-physical concepts (Roboubi, 2005). Reproducible values of vernacular architecture in each fields considered in sustainable architecture is as follows:

Social and cultural aspects

1. People enclosing: vernacular architecture has sensitive behavior in relation to the culture of community members; including inwardness that considering the needs of users is from the perspective of his need to privacy and security.
2. Compatibility: compatibility with building residents because of flexibility



Fig. 1: Human fitness proper to the building

3. Making nature meaningful in architecture that causes to create culture of proper consumption and contentment.
4. Retrospection (changing bad habits): avoiding unnecessary things which lower efficiency. Ability and our willingness to change our mind may can solve some problems, even more than finding a certain solution for a problem.

Environmental aspects

1. Considering semantic properties of nature are made that causes to make sense of respect to nature, contentment and making meaningful.
2. Considering physical properties of nature and climatic designing and compatibility with the surrounding environment.
3. Self-sufficiency of using local materials: using safe materials, healthy and local, existing technology, responding and possibility of performances that are arranged results in today constructional activities. The focused energy and some consequences such as concepts of sustainability, maintainability, serviceability and simplicity are considered.



Fig. 2: Using local materials

1. Avoiding from the futility of contentment that causes to saving consumption of resources and consequently, causes to reduce costs.
2. Flexibility of building that leads to increase its life, thus, it decreases the need to create new spaces and destroy useless spaces.
3. The need to build strong buildings that decreases costs of fixing and maintaining. Features that are mentioned can be considered as the reproducible values of vernacular architecture in the process of sustainable architecture in order to today construction (18).



Fig. 3: Application of the calculations for design

CONCLUSION

Sustainable architecture does not include preset and certain patterns that it can be repeated; but it is dynamic architecture and should be compatible and harmony with nature and climatic features of every region and what make our country's vernacular architecture lasting and unique is considering these features. In other words, sustainable architecture has various dimensions that considering all its dimensions is essential. Vernacular architecture is applied at any point in the history. Although vernacular architecture has been changed by different phenomenon throughout history, it could preserve to its specific identity and since it takes into account as a valid birth certificate of people of a country, it indicates their customs, spirit and emotions, thought and idea, interest, taste and art. What is mentioned as local values in sustainable architecture, because of its responding to climate, culture, society and generally sensitivity to its surrounding environment is more valuable in different dimensions. By relying on the correct, rational method in understanding national culture and back to ourselves, we can study and analyze accurately barriers to the creation of vernacular architecture through active thinking. They can be solved by considering sustainable architecture as a process and considering local grounds of its forming. Principles of local and traditional designing can be consistent and harmony with each other based on residents' needs in every region and sustainable development in construction, urban and locality designing. It can also provide a way to achieve sustainability by taking advantage of local sustainability. The key of sustainable future is in the use of low-energy systems of constructions and considering ecological and environmental necessities.

CONFLICT OF INTEREST

There is no conflict of interest

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REFERENCES

- [1] Dadkhah M. [2005] A Survey on Vernacular Architecture Range of Tehran, Faza Publishing.
- [2] MahdaviNezhad Mohammad J. [2004] The Leading Architects and Link to the Past, Abadi Quarterly Journal.
- [3] Sarami, Ali A, Radmard T. [2008] Sustainable Values in Architecture of Iran, Publications of Cultural Heritage Organizations of Iran, Tehran.

- [4] Mahmoudi, Mohammad M. [2009] Housing Development Compatible with Sustainable Development. Tehran University Publishing, Tehran.
- [5] Roaf Sue, et al. [2005] Adapting Building and Cities for Climate Change; A 21st Century Survival Guide. Maryland: Architectural Press,
- [6] Amir Bani, M. [2013] Post-modernity and Postmodernity Architecture and Architecture: Studying the Intellectual Currents of Contemporary Architecture of West, Khak publishing.
- [7] Asquith L, Vellinga M. [2006] Vernacular architecture in the 21st century, Taylor & Francis.
- [8] Armaghan, Maryam, GorjiMahlebani, Yousef [2009] Quarterly Journal of Housing and Rural Environment, vernacular architecture values in relation to the approach of sustainable architecture.
- [9] Scott A. [2011] Dimensions of Sustainability : architecture form, technology, environment, culture, New York : E & FN Spon
- [10] Yousefi, Naseh [2006] The role of Nature in Forming Architecture, Educational, Research, Analytical and Nasr, SeyyedHossein, Miyandari, Hossein [2010]Taha Publishing, the Need to Sacred Science, Qom.
- [11] Nasr, SeyyedHossein, Miyandari H. [2010]Taha Publishing, the Need to Sacred Science, Qom.
- [12] Burkhardt T.[2013] Translated by Jalal SattariSarv-e-Honar-e-Moghaddas, Tehran.
- [13] Akrami, Gholam R. [2010] Quarterly Journal of Housing and Rural Environment.
- [14] Cooper, Liay, Dawson B. [2010] Traditional Buildings in Architecture, Thames & Hudson, London.
- [15] Leccese M, McCormick K. [2009] Charter of the new urbanism : congress for the new urbanism, New York : McGraw-Hill Education
- [16] Razjouyan M. [2007] Comfortability by Architecture Harmony with the Climate, ShahidBeheshti University.
- [17] Azarbaijani Mona, Mofidi M. [2004] The Concepts of Sustainable Architecture. Set of articles conference on optimizing fuel consumption in construction. 1.
- [18] HatamiGolzari Elham. [2008] Vernacular Architecture of Iran and Sustainable Development. Engineering Journal of Infrastructure.
- [19] Aminzadeh B. [2004] The effects of Ecology and Biology on Architecture, Quarterly journal of Architecture and Culture. 13(18).

ARTICLE

RANKING FACTORS AFFECTING SARI CITIZENS' TENDENCY TO PARTICIPATE IN PUBLIC SPORTS

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ABSTRACT

The present study was carried out to ranking the factors affecting Sari citizens' participation in public sports. It is an applied research and concerning data collection method, it is a descriptive (non-experimental) study. Statistical population includes all Sari citizens from which, 384 people were selected as sample using Morgan table. Data were analyzed by mean test and Friedman test using SPSS software. Data indicated that informing by public media, notifying by educational institutes, friends and personal and social thinking had effect on citizens' tendency to participate in public sport. Moreover, results of Friedman test showed that the most effective factors were informing by public media (3.43), social thinking (3.28), friends (2.95), personal thinking (2.79), and notifying by educational institutes (2.55); respectively. Finally, some recommendations for enhancing Sari citizens' participation in public sports are offered.

INTRODUCTION

Despite its simple exercises, public sport can play important role in citizens' health. Moreover, this type of sport is free and does not need huge investment by the citizens. Thus, it is necessary to investigate the social factors affecting citizens' tendency to participate in public sport as by identifying these factors, public managers and planners can include the sport in citizens' leisure time by a sophisticated planning and help the people select the sport as the base of their life style. Public sport is not a duty, but is an opportunity; it is not a public sport, rather, it is an individual sport that can be practiced individually or in a group. However, a global movement is required that extends highly different life styles and plans [1]

KEY WORDS

public sport, personal thinking, social thinking.

Today, by extension of urbanism, popularity of business systems and mechanization of activities, people access to various services has been enhanced, the activities have been more specialized and people physical activity has been reduced. Extension of public sport proportional to activities types and personal and professional conditions can compensate a part of immobility and bring about social vitality and national productivity [2].

Since public sport is cheap and easy to access, all citizens can be benefited by it. This sport type is established to enhance participation of all social groups and to provide athletic pluralism, improved public sport, competitive sport, healthy recreations and recreational sport (Roshandel, 2007, 54). However, public sport depends on geographic, regional and social-cultural condition and includes all organized athletic practices and unorganized recreational activities and native-local games and is completely public [3].

Under sport architecture of Iran, sport management in macro level is interested in championship sport and a lot of time, power and financial resources have been allocated to championship sport. Severe tendency to championship and neglecting public sport, that can be important for public health, is a major defect in Iran sport structure. Public attention is also directed to championship due to its beauties and propaganda of public media. Thus, public sport has not been well established among people [4].

Like every other system, public sport requires setting general goals, strategies and operational programs so that along with identification of the way, any kind of repetition, deviation and financial, human, physical and informational loss is avoided. Despite its simplicity, public sport plays important role in citizens' health. Moreover, public sport is free and does not require huge investment by citizens. Thus, it is necessary to investigate social and political factors affecting citizens' tendency to public sport, because identification of such factors can help public planners and managers to include the sport within citizens' leisure time via an exact planning and thereby, people adopt a sport-based lifestyle.

Literature review

In a study entitled "public sport in Iran and establishment of future horizon, strategy and plans", Javadipour et al [2013] found out that public sport lies on SWOT coordinate system which is placed in strength region regarding internal factors and in opportunities region concerning external organizational factors. Thus, offensive strategy was recommended for extension of public sport. Moenodolati [2012] investigated the sociocultural factors affecting citizens' tendency to public sport in Gorgan. Results indicated that personal attitude to body, media usage and sport-based cultural capital had direct effect on citizens' tendency to public sport; while sport-based economic capital and sport-based social capital had an indirect effect which was mediated by sport-based cultural capital. Saminia [2012] studied strategic pathology of public sport in Iran and development strategies based on SWOT model. Data analysis was

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performed by mean comparison and Friedman test. By investigating current status of public sport in various fields as human source, coaches, education, talent discovery, equipment and infrastructures, referees, finance, research, information technology and marketing and data analysis, ten strength points, ten weakness points, twelve opportunities and seven threats were identified. The results showed that public sport is placed in strengths region regarding internal factors and in opportunities region regarding external factors in SWOT coordination system. Michael F Collins [2002] investigated public sport in England and showed that housewives, people without or with low special skill in athletic courses, people lacking vehicle, low income or unemployed people and people with mental abnormality were not able to use public sport facilities. Hoven [1999] emphasized cultural aspects of sport. In this regard, most researches have dealt with ethnics and races and their participation in sport and some authors have tried to approve that sport can address the problem of racial discrimination and differences.

MATERIALS AND METHODS

Regarding its objective, this is an applied study and concerning data collection procedure, this is a descriptive (non-experimental) field study and regarding the variables interrelations, this is a correlation survey. Statistical population includes all Sari citizens who practice public sport in Sari parks which is an infinite population. According to Morgan table and Cochran formula, 384 people were selected as sample and to ensure questionnaire return, 200 questionnaires were distributed among the citizens by simple randomized method. Data were collected by a combination of library and field methods. In this method, two author-synthesized questionnaires were used. Although the questions were extracted from valid resources, content validity method was used to evaluate validity of the questionnaire for localization. For this, a version of the questionnaire was submitted to professors to evaluate its content validity and their comments were considered in the questionnaire. For this, some ambiguous questions irrelevant to topic, special field and statistical population were removed and some items and questions were expressed more explicitly. Reliability was measured by Cronbach's alpha method. Data analysis was conducted by descriptive statistical indices such as frequency, mean, standard deviation, tables and graphs. Data normality was measured by Kolmogorov-Smirnov test. In inferential statistics part, one population mean comparison and Friedman tests were applied. Data were analyzed by SPSS software.

Hypothesis test

Table 1: Significance level of normality test for the research variables

Significance level	Variable
0.169	Informing by public media
0.122	Notification by educational institutes
0.166	Friends
0.109	Personal thinking
0.062	Social thinking

According to [Table 1], error level of every variable is higher than 0.05; thus null hypothesis is approved suggesting normality of data distribution and thus, parametric statistics can be used.

Table 2: Results of t-test for hypothesis

Standard deviation	Mean	Significance level (p)	T	df	Variable
0.618	3.375	0.001	109.173	383	Informing by public media
0.679	3.0961	0.001	91.159	383	Notification by educational institutes
0.592	3.29	0.001	110.215	383	Friends
0.593	3.204	0.001	107.64	383	Personal thinking
0.556	3.36	0.001	119.642	383	Social thinking

Hypothesis 1

Informing by public media has significant effect on citizens' tendency to public sport.

[Table 2] shows that mean value of informing by public media is 3.375 which is three times higher than test value. Regarding estimated significance level as 0.001 which is lower than 0.05; null hypothesis is rejected and the alternative hypothesis (H1) is approved; meaning that informing by public media has significant effect on citizens' tendency to public sport ($p < 0.05$).

Hypothesis 2

Notification by educational institutes has significant effect on citizens' tendency to public sport.

[Table 2] shows that mean value of notification by educational institutes is 3.0961 which is three times higher than test value. Regarding estimated significance level as 0.001 which is lower than 0.05; null hypothesis is rejected and the alternative hypothesis (H1) is approved; meaning that notification by educational institutes has significant effect on citizens' tendency to public sport ($p < 0.05$).

Hypothesis 3

Friends have significant effect on citizens' tendency to public sport.

[Table 2] shows that mean value of friends is 3.29 which is three times higher than test value. Regarding estimated significance level as 0.001 which is lower than 0.05; null hypothesis is rejected and the alternative hypothesis (H1) is approved; meaning that friends have significant effect on citizens' tendency to public sport ($p < 0.05$).

Hypothesis 4

Personal thinking has significant effect on citizens' tendency to public sport.

[Table 2] shows that mean value of personal thinking is 3.204 which is three times higher than test value. Regarding estimated significance level as 0.001 which is lower than 0.05; null hypothesis is rejected and the alternative hypothesis (H1) is approved; meaning that personal thinking has significant effect on citizens' tendency to public sport ($p < 0.05$).

Hypothesis 5

Social thinking has significant effect on citizens' tendency to public sport.

[Table 2] shows that mean value of social thinking is 3.36 which is three times higher than test value. Regarding estimated significance level as 0.001 which is lower than 0.05; null hypothesis is rejected and the alternative hypothesis (H1) is approved; meaning that social thinking has significant effect on citizens' tendency to public sport ($p < 0.05$).

Table 3. Results of Friedman test

Average rate	Variable
3.43	Informing by public media
2.55	Notification by educational institutes
2.95	Friends
2.79	Personal thinking
3.28	Social thinking

[Table 3] shows that informing by public media and notification by educational institutes have the highest and the lowest scores; respectively.

DISCUSSION and CONCLUSION

Hypothesis 1

Informing by public media has significant effect on citizens' tendency to public sport.

Mean value of informing by public media is 3.375 which is three times higher than test value. Regarding estimated significance level as 0.001 which is lower than 0.05; it can be claimed that informing by public media has significant effect on Sari citizens' tendency to public sport ($p < 0.05$). Results of Friedman test indicated that informing by public media has the highest influence on Sari citizens' tendency to public sport. This finding is in agreement with those reported by Moeinodolati [2012].

Hypothesis 2

Notification by educational institutes has significant effect on citizens' tendency to public sport.

Mean value of notification by educational institutes is 3.0961 which is three times higher than test value. Regarding estimated significance level as 0.001 which is lower than 0.05; it can be claimed that notification by educational institutes has significant effect on Sari citizens' tendency to public sport ($p < 0.05$). Results of Friedman test indicated that informing by public media has the lowest influence on Sari citizens' tendency to public sport. This finding is in agreement with those reported by Moeinodolati [2012].

Hypothesis 3

"Friends" variable has significant effect on citizens' tendency to public sport.

Mean value of "friends" is 3.29 which is three times higher than test value. Regarding estimated significance level as 0.001 which is lower than 0.05; it can be claimed that "friends" has significant effect on Sari citizens' tendency to public sport ($p < 0.05$). Results of Friedman test indicated that "friends" has

the third priority regarding influencing on Sari citizens' tendency to public sport. This finding is in agreement with those reported by Hoven [1999].

Hypothesis 4

Personal thinking has significant effect on citizens' tendency to public sport.

Mean value of personal thinking is 3.204 which is three times higher than test value. Regarding estimated significance level as 0.001 which is lower than 0.05; it can be claimed that personal thinking has significant effect on Sari citizens' tendency to public sport ($p < 0.05$). Results of Friedman test indicated that personal thinking has the fourth priority regarding influencing on Sari citizens' tendency to public sport. This finding is in agreement with none of previous researches.

Hypothesis 5

Social thinking has significant effect on citizens' tendency to public sport.

Mean value of social thinking is 3.36 which is three times higher than test value. Regarding estimated significance level as 0.001 which is lower than 0.05; it can be claimed that social thinking has significant effect on Sari citizens' tendency to public sport ($p < 0.05$). Results of Friedman test indicated that social thinking has the second priority regarding influencing on Sari citizens' tendency to public sport. This finding is in agreement with those reported by Moeinodolati [2012] and Hoven [1999].

CONFLICT OF INTEREST

There is no conflict of interest

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REFERENCES

- [1] Javadipour M. [2011] Strategic plans of public sports federation. Research plan, ministry of youth and sport, public sports federation
- [2] Qolinia M, Javadipour J, Farajzadeh M, Eftekhari S, Gol E. [2008] The concept of identification of public sport for marketing of citizenship sport position
- [3] Gayini A. [2008] Perspective of public sport, growth of physical training education, 26.
- [4] Ahmadi Mozaffari A, Ghareh M. [2008] Status of public sport in Iran and its comparison with some selected countries, journal of mobility and sport science, 6.

ARTICLE

PRESENTATION OF POSTMODERN THEORIES AND PATTERNS IN CREATING THE REGIONAL IDENTITY AND CREATING RESIDENTIAL AREAS IN IRAN

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ABSTRACT

In order for the city to be able to determine itself in the area and to find the ability of readability, it must merge the semiotic systems with the other systems of architecture and urban planning. Our current cities, despite the old identities of many of them which exist in their area and architecture, go toward a kind of formlessness for years and their outer expression face has been appeared in an identity-free but profitable architecture and urban planning. In this article, we try to investigate the postmodern theories in creating area in the architecture of Iran. Firstly we briefly express the postmodern theories and the way of their entrance to architecture, then according to the importance of using these theories in the process of designing and creating area, we briefly define each of the theories. We also know that architects use these theories in creating area consciously or unconsciously. According to the fact that the discussion of area is always one of the most important discussions in the field of architecture and based on the necessity of the entrance of its concepts from the domain of theory to action, it is one of the challenges facing the contemporary architecture. With conducting studies and adapting it with the current situations of the society of Iran, the way of representation of postmodern identities and its theories in the residential areas of the city is studied. Also we also study the investigation of the mutual effects between human and environment and how they appear in residential areas and lead to the formation of identities. The aim of this article is the fact that what effects the postmodern theories have on creating the architectural area in Iran and what their role is in the introduction and recognition of architectural area and identity.

INTRODUCTION

The concept of area is one of the fundamental concepts in architecture. Architects have presented various perceptions about this concept from a long time ago. In some of these definitions, the human role in understanding the surrounding area is mentioned since there are some relationships between each two living creature and its surrounding environment whose adventitious aspect is considered more than its instinctive aspect. In this definition, human must learn the concept of things in relation to his environment. Through time and with the increase of experiences by the formation of a huge network of information in mind, we will be capable of recognizing many things and this recognition gives us the power to control our environment, even without the fact that in every moment everything faces our understanding directly. Thus it becomes clear that the role of environment in understanding architecture and its related areas is inevitable [1]. What here is more acceptable is the definition of area which contains both elements of human and his surrounding area. It means the definition which considers the area as a result of interaction between human and his surrounding environment. According to this definition, the discussion of understanding of human of area finds great importance which this issue in the contemporary ages has led the scientists to think about presenting patterns to promote the quality of design of architecture area. Today we can witness some differences between the theoretical basics in the work of the architects, in a way that each follows special fundamental principles and these theoretical basics are effective in the process of their work of design and elements which they use in creating architectural area. Humans create a continuous and mutual relationship with the area by living in it: He feeds from it and feeds it. He receives changes from it and changes it. He moves in that area and creates meaning in that area with his movement. He transforms the parts of area to meaningful signs for himself and or adds some signs to the area from the outside [2]. As a result, the local identity is a part of infrastructures of individual identity of human and the result of his general recognitions about the physical world in which humans live. And in this way they emphasize the importance of balanced relationship between the local identity of the individual and the features of external environment [3]. For this aim, it seems that the postmodern thoughts in the domain of identity study the urban life in particular. This is through architecture that we could organize the area consciously in this urban life and to form the concept of living in houses which expresses the creation of a meaningful connection between human and a supposed environment and to organize the area in some way that the wants of the individual and group is kept safe in the domain of private and public privacy for the appropriate living of human and society in this way through many years with the continuous presence in the land of Iran. The aim is to enter these theoretical basics which are presented in the frame of postmodern theories and are often presented in the theoretical domain to the operational and functional area of architecture.

KEY WORDS

Postmodernism, Urban Architecture, House, Iran, the Identity of Creating Architectural Area

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The Hypothesis of the Research

Different styles of architecture are effective in creation and building of residential and urban areas.

Methodology of Research

In this article, the methodology of research is based on library studies which are collected based on collection of documents form websites, articles and books.

Theoretical Basics

Architectural Area

The architectural area is defined based on Euclidean geometry, based on which architectural area is a qualitative area meaning that it pays attention to the special relation between them. This space is real and surrounds human and has a practical aspect, the area based on this includes the area itself and its siege. This area means the limited area between elements and the area of environment on them. The elements of area include place, path and axis and section. In the concept of area, there is also the subject of organizing the area and its meaning is the way of orientation of human against his surroundings. In the concept of area based on the area of the existence, structure has a place in creating the form as one of the effective parts [4].

The definition of identity in architecture

The skill and art of architecture is one of the most important signs of culture of each nation and each historical period and is representative of biological area in any time. Architecture is always the subordinate of known principles and has a firm link with culture and values of the society. And for the same reason the architectural style of each period is considered as a reflection of the culture and art of that period. Thus can we search the architectural identity in the cultures and traditions of society which is formed in each historical period? The new style of architecture is sound on the past methods and principles and for the same reason there is a strong relation between various styles of architecture in the past among which ridging seems to be impossible. This closeness of methods and principles among the different styles comes from the culture and traditions of the people of society which with little change in the new ways of people's life, has led them to get familiar with the roots and culture of time and place of their society. And that all the styles of architecture which has caused the growth and development and evolution of architecture, because they changed the previous style or evolved it, they ruined the traditional culture and architectural identity of their time and generally people weren't responsible for spending their lives and efforts and start a innovation and they had to go after the past tendencies and traditions. This perspective is a biased perspective, even though with a little thought, we can challenge their tradition with the development of that same tradition, because it is possible that whatever is modern today will be tradition tomorrow. Thus we can say that if the architectural identity is defined in culture and tradition, the architecture which is based on tradition and culture and need of today but not the past is the architecture with identity and this identity will always be accompanied with us [5].

Today there are two perspectives about the identity in architecture:

- 1- The Traditional Identity: which some people believe that the factors like level, race, and religion and gender play part in creating a determined and coherent identity.
- 2- The Structural Identity: which focuses on the structure of identity and aims to form each identity in a determined and clear way and for studying it we must consider both psychological and sociological factors.

This point is important since today's identities are multi-sliced and multi-faceted, none of these theories can contain all the human experience about their and other's identity and it finally includes only some of the aspects [6].

The postmodern theories and patterns in architecture

Phenomenology

It's a philosophical theory whose reliance is on the method of research and study. This theory has a postmodern approach to site, place, view and building. "Phenomenology" in architecture has a deep attention to the way of constructing things and details related to it like the sensory qualities of materials, light, color, etc. Its effect on architecture is determined in the study of generating roots of architecture with the phenomenological perspective in a way that the thoughts that study the things themselves are replaced by formalism in architecture [7].

Deconstruction

Deconstruction is a philosophical and linguistic action, which pays attention to foundations of thought in deconstructing and foundations of majors like architecture. Deconstruction shows that all issues are in fact structured issues. The context of architecture must be potentially unlimited, not in the way that is included in the traditional systems and species, but in the way that they will intersect and conflict with systematized limits [7].

Structuralism

Structuralism is kind of study method in linguistics which generally believes that the essence and true gem of things is not in themselves, but is in the relation which we create among them and then we receive it. The structuralists emphasize the contracts and processes that lead to intelligibility of a work with codes, meaning the way of creation of an obtainable definition. Structuralists use linguistics like a method and try to create language grammars, meaning a list of systematic elements and the possibility of their composition and mixture which shapes the form and meaning of the architectural forms [7].

The investigation of patterns of creation of architectural areas with reliance on postmodern theories

The constituent elements of area, are the same thing which creates the areas between their levels [8]. The constituent elements of area are considered in the form of two categories: structural elements and peripheral elements. Structural elements include: the horizontal elements (ceiling and floor), vertical (wall and column), communicational (stairs, ramp, hallway), openings (doors, window) and furniture (fixed and mobile) and the peripheral elements include: light, Fragrance, temperature, humidity, sound and all the cases which influences the way of human understanding from area. According to the art-patronizing essence of architecture and the fact that in art there is no way to finality and there is always some amount of relativity, we should consider that in this part it is possible that the projects contain the features of several parts at the same time.

The pattern of creation of architectural area by the phenomenological theory and pattern

According to this theory, the architects create the building in the simplest form in a pure and distinct way. In addition to form, materials and colors are also selected very simple [9]. For example, using natural light with many openings toward free areas of huge stairs is for decreasing the closed area and adding to the half-open area in the creation of these buildings like Wright's works who has used huge glass stairs and areas for natural light and nature in the Falling water house.



Fig. 1: Falling water house

Creation of area pattern and the theory of deconstruction

In new experiences, new geometrical definitions provide the possibility of creating areas with special features in which the line between the inside and outside is disappeared by the geometrical relations. This border-less situation in area which is somehow the carrier of the concept of spatial continuity can be used in architectural works like Zaha Hadid. Hadid observed that she can use the folding of areas and link them together [10].



Fig. 2: Border-less buildings

Creation of area in pattern and the structuralism theory

The architects who create their works in this domain often determine a distinct structure and base the basics of their design on that structure. For example Norman Foster and Richard Rogers always apply using technology and stable energies on their work. Calatrava always uses the structure of existing patterns in nature in the creation of his works. He believes that in nature there are thousands of inspiring and stable structures. He extracts many metaphors from the nature by observing the skeleton of plants and animals, including the optimized usage of materials and capabilities of the living creatures for transformation, growth and movement. He also uses order, rhythm and other natural patterns in addition to above cases [11].



Fig. 3: Buildings like skeleton of plants and animals



Fig. 4: Modern architecture

The effect of postmodernism on the identity of architectural area

What is called the procedure of transformation to postmodern shapes and its effect on identity is fundamentally divided into three procedures:

1. Pre-modern Identity 2. Modern Identity 3. Postmodern Identity

In pre-modern societies, the identity has a social essence, but doubt or conflict doesn't influence it. The individual identity is stable, because the archaic myths and pre-determined systems of roles define and protect it. You are a part of archaic relative system. Your thought and behavior is confined in a limited worldview and your life path is somehow determined for you. Therefore you don't need to question your position in the world. Identity is not the issue [12]. According to this, in the pre-modern world, each individual is the heir of his ancestral identity and the identity is considered as an inheritable issue. The thought of human is located in a determined frame and the way and style of his life is pre-determined. The relationships among people are limited to cross-tribal relations and everyone plays a distinct role in society and human has an individual and distinct identity.

In the modern period which starts with the age of illustration, identity faces crisis for the first time. The individual identity still remains based on the relationships of the person with others like the pre-modern cultures.

This identity keeps its own stability to some extent, but its branches and effects starts to duplicate. In the pre-modern societies, you exactly knew where you are in the tribe, but in modern societies, a more vast collection of social roles is given to you. Instead of being born with your identity, you can eventually choose. In modernity this belief exists that putting the limitations of tradition aside accelerates the movement toward human freedom, but valuing the present and future and falsifying a past which is considered as the basics and activities of the individual, forces people to question the nature of their identity. To summarize the identity becomes an issue [12].

Social life compared to modern period is becoming faster and more complex and its requirements are becoming more and more. More possible identities are being displayed in front of our eyes and we must accept many roles which are developing very fast as the society is eventually tearing apart. Therefore in this approach, the emphasis is changed from the public social factor to the local and private citations of determined and tangible people. Therefore we have two spectrums: the spectrum which modernists make who believe in the public state of human idea and believe that writing a unitary prescription across the earth is important and appropriate and the spectrum which postmodernists make and only emphasize the divisive and controversial forces which are hidden in every apparently monolithic identity, which in this way the establishment of collective identity is destructed.

Postmodernism and theories in architecture and urban planning

We can call the postmodernism a stream which is in fact a result of modernism and is an effort for finding answers for solving the modern conflicts and exiting the deadlock of Modernism. Even though today the post of modernism is accepted everywhere, there has not been an exact definition yet given of it. Therefore, most of the scientists call it a situation or a position. Postmodernism is fundamentally an eclectic mixture of any kind of tradition with the past traditions. It is both the resumption and continuation of Modernism and its excellence and integration. The primary feature of postmodernist works can be searched in multiple, ambiguous, ironic and satirical codes and passwords, various and widespread selections, contrast and lack of continuation or separation in traditions [13]. The primary motivation of the generation of postmodernism was the social failure of modern architecture and urban planning and the criticism of the perspective that modernism had conducted of itself. The modern town failed, because it was incapable of creating a relationship with the residents and the consumers, thus, postmodernism acts as a tool for creating a relationship between the town residents and its different parts in different levels.

Architects and urban planners which are called postmodernist do not believe in the universal definition, nor do they throw themselves in the trap of meaninglessness. Thus, we cannot call them postmodernist. This category of architects never erases the background and therefore, they speak of showing the architecture which is congruent on the opposite facts and they believe that we can make them more upright and more appropriate with minor changes. These have no common aspect with the thoughts based on meaninglessness and denial of postmodernists' truth and we must call them "The Transition from Modern". However, "deconstruction, phenomenology and structuralism are theories and patterns which are totally appeared in the architecture and urban planning that postmodernists have designed and we can regard these theories as exactly congruent on the achievements and thoughts of "postmodernism", which each of these patterns can transform the structural and contextual and conceptual aspect of area.

Town, architecture and the quality of creating architectural area in the postmodern period

The postmodern period has been the period of fundamental changes in all the arena of human life including in the field of architecture: "In fact, we live in a period which its parts and elements take the distance from the humane center and any kind of rational and dependent destination toward humanity with much acceleration" and humans feel that they live in a purposeless, meaningless and without future society and in a city which the understanding and controlling its dominant rules is out of their responsibility. In fact, with the start of the postmodern period, a new season of self-alienation and irrationality and frustration has been occurred and people's feelings, tendencies and thought have been fundamentally changed. The architects and urban planners have entered a very ambiguous and unfamiliar domain in which nothing much can be seen. The postmodern architects and urban planners seek a multiple approach and regarding the results which are gained in other systems and for the postmodern architect anything can serve the idea of design. The postmodern architecture and urban planner is a mixture of different cultures and traditions. The primary feature of the postmodern residential area can be searched through the multiple, ambiguous, ironic and sarcastic codes and passwords, various, widespread and opposite selections, and in the lack of continuation, separation and lack of congruence or in simplicity and or complexity and border-less state. The common aspects of architects are their common style against modern and versatile and multi-meaning logic and rationality of town and residential areas. From the perspective of postmodernists, the residential areas in cities are like intertwined contexts of events inside it which appear and in them, different spatial areas, usages and activities are mixed together and as the result, the context and shape of the area is determined. In fact, the architecture of postmodern city is shaped by language games which are constantly developing. Each game has its own special rules, myths and special claims which all are counted as the representatives of the essence, character and the nature of postmodern urban life. And thus the postmodern architecture becomes the place for changes, and ability of mobility and movement of things and areas; a place of interference of humans, cultures and nature, without any one of them having excellence over the others. In this case, the responsibility of postmodern architects is to simplify the stream of activities, not to discipline and consolidate them [14].

The postmodern period is the age of invalidity and break of huge facts of metaphysics. This broke-inside existence with the use of Derrida's metaphor has itself changed to the endless process of various interpretations and paraphrases. In the postmodern perspective, everyone is qualified to contemplate the different aspects of existence based on his mental values. "Distribution and extension of multiple identities have led to the fact that no culture and metanarrative would not be capable of responding the new issues facing humans". This is why postmodern urban planning seeks a multiple approach and

considers the achievements which are resulted in other noetic systems and for the postmodern urban planner anything can bring about the design idea. This strategy demands an area which is independent from "strict logic-orientation" and "style-orientation and emulation of pre-made symbols" of the recent modernists [15].

Appearance of postmodern perspectives, creation and regional identity of residential areas in Iran

Human will find himself when he has settled and as a result has proved his own existence in the world. The essence of this verbal debate is between the departure and return of an existence which is framed into the work by architecture [16]. Therefore we study the house which is considered as the mental symbol and also the objective manifestation of the private territory and investigate the inside and outside role of the house and the inside mobility of the private area. The inside of the house is regarded as a spatial-social arena in which the change of private mutual relationships and the somatogenic features of the house during different periods refers to the complexity of the subject of private privacy, as reflected in the change of family images and interior area [17]. The process of house changes in the time and place period is a subject which must be considered. The study of kinds of houses in different times and places emphasizes the fact that spatial concepts and visions located on Iranian houses is not exclusively belong to our country and they have been designed and experienced in many regions of the world from the past to today.

In the late Gothic period with the formation of individualistic thought and the manifestation of the inner world of the individual, the house became the spatial manifestation of individualistic thought and the architects were asked to do the views and living rooms more and finally the spatial concepts of the houses take a distance from the shapes which were prevalent previously and many various perspectives were found [18]. Rybczynski in his book named "House", refers to the effect of dominance of rationalism over society and the appearance of technological developments on the house and he represents this effect in the frame of change of the concept of convenience and comfort and its evidences, a concept whose new evidences have played a major role in the spatial structure of the houses and have replaced the ritual-cultural various concepts, which previously influenced the way of construction of the houses. He introduces the obvious representation of this concept in paying attention to the concept of performance in the house. Furthermore, Rybczynski has referred to the change of pattern of family from big families to small families and following that, the change of houses from some big and crowded houses to small houses which provide comfort for the individual and that family [19].

Also this change of perspectives and views which has been influential on the architects, have also been influenced by culture and identity other than different styles and theories, as the modern and after-postmodern theories and patterns had influences on life and creation of biological areas, like using simple forms and or layered and complex shapes and also the merge of architecture of areas with nature and using codes and passwords in architecture which was the indexes of postmodern architecture and all of this have had an influence on the architecture of residential areas. In a way that with the update of architecture in Iran and usage of different styles of architecture for example postmodern, the making and creating residential areas has also changed and transformed in a way that in the past houses were built in the form of giant and luxurious buildings, but today and with the development of technology and the growth of science and increase of population, this type of lifestyle has decreased and the house is built in a simple way which this can be because of following the postmodern style and or in spite of simplicity and usage of simple forms of geometry, special and delicate complexities were being used in the designs so that residential areas could be easily created. Using stable energy was one of these cases which postmodern architects used. In spite of all these cases, identity has also had influence on creating residential areas in a way that the state of becoming without identity in Iran has occurred due to two essential reasons. The first one is due to the economic general crisis which has led to the irregular increase of urban population in the years of 1956 till today and has transferred Iran to a totally urban country with people who are mostly consumers. And naturally this event couldn't occur in the spatial domain and in a very short time without constructions which are without identity and just for affording house in the shortest time and lowest prices possible. This issue has caused people to live in similar and spiritless and meaningless areas in their daily life. The other reason which has caused this lack of identity is the increase of existing shapes in lifestyle which has occurred due to media and information revolution. Today people believe that they have the right and possibility to live in any shape or style that they want and transfer this to the surface of town and its areas [20]. In Iran, the contemporary houses from the 40s and after have faced the decrease of the role of area. The process of area removal and lack of attention to the creative organizing of area in contemporary residential apartments have been faster and have influenced the concept and evidence of house and settlement. Replacement instead of repairmen: what happened in our towns was the lack

of timely interference in historical contexts, not balancing these contexts against automobile and not repairing them. The result was that against the selection of automobile or historical context, the automobile was selected and against the generation of new urban aspects, the historical context got injured and this is one of the most important phenomena of change in way of life which replacement sat in the place of repairmen [18].

The dominance of things over the spatial structure of house and the role of area fading: our architects, who had generally achieved their architecture knowledge from abroad, represented newer spatial patterns which were highly welcomed because they were facilitated by piped water, electricity, telephone, etc. the dominance of things over architectural and residential areas in Iran has been due to new architecture majors and styles which has found prevalence in our country. For example, using the interior design major in which the usage of their things and furniture in the residential area is more important than the area itself for the residents and using postmodern style in the background. Using simple areas in this architecture is observed more in the residential areas in Iran and the main emphasis is on the interior design. The convenience of small houses against the hardships of old houses, the proximity of bathroom and WC and toilet to rooms, generation of things replacing areas like refrigerator and freezer, etc. in a very short time changed the transition of house and settlement to other alternatives [18]. What has happened in the last four decades in Iran is the inclusion of life concept in performance and decrease of the concept of performance to one of the biological needs like sleep and food. In this way, it is the role of things that has found importance. The importance of things and their decoration in the spatial organization of contemporary houses is fundamental. So fundamental that area finds identity with their movement and the true manifestation of performances depends on the existence and decoration of house things. In such a situation, the determination of the role of areas is put upon things [18].

CONCLUSION

Generally, appropriate and correct deployment of the constituent elements of architectural area is technical which should be learned step by step. The creation of an appropriate architectural area is the result of such an ordered and exact thought and intellection and follows distinct principles and skills. The purpose of learning different patterns of creation of area is making a primary system for learning, configuration and the spatial messages. Knowing all these factors besides the recognition of the mechanism of discovering area helps the better understanding of spatial messages of architecture. According to the conducted investigations, we can say that today, some patterns are being used by the architects for the creation of area which most of them are orderly and none of them is gained accidentally, therefore the more these patterns and theories can be clarified, and challenged more exactly, the more the possibility of designing appropriate areas will be, because the recognition of influential criteria before creating it is one of the most important factors in a creative design. According to the conducted investigations about the way of deployment of somatogenic and environmental elements in each of the stated theories, what is observed more than comparative study among them is the fact that among them, the phenomenological theory has a totally different approach compared to other theories, because in this theory, more than any other, the emphasis is on the usage of philosophical concepts and the purity of environmental elements in creation of area to the point that these elements serve the somatogenic elements. In the modern and contemporary period, macro policies and plantings of government and municipalities about the architecture, house building and mass production, have had and have an influential role in the way of culture of contemporary house. In a way that using new and up-to-date architectural styles in designing residential areas is very eye-catching, including the postmodern style and its theories which for example, we can name phenomenology in which the attention of the builders is drawn more to simple forms in designing using simplicity and purity in design and people and residents use interior designs for the buildings' attraction of attention. Also in the situations of the pre-modern society, the governments have no role in the house building and house more than anything is considered a private case and issue. Today, house is a part of urban area and should be in concordance with local, regional and urban structures and also the macro national policies. In these situations, people are can only choose their own favor and style about the "insides of the house". Other theories are presented, like structuralism in the way of using dominant roles on the language structure, in post-structuralism in the way of breaking the prevalent conventions and creation of new way of relation between language structures and finally deconstruction in the way of ignoring all the existing presumptions, which in the building and creation of residential areas, each of these theories can be interfered into the design. As a result, what is referred to as the patterns of creation of area today, is mostly concluded form the stated theories. Of course this point must also be considered that in addition to these theories and patterns in the building and usage of these cases in the Iranian settlement, house is also a matter of culture. In other words, house is a kind of "biological

need” which “the house culture” is shaped for satisfying this need and is merged and matched in the generality of social system and human culture. The fact that which symbols and signs we should use in the house is responded by the “house culture in any society. The culture of house is a subset of the generality of culture of society. This is why any society has its own special culture, a culture appropriate to history and geography and experiences of a nation and people and with the changes of culture and social conditions, the culture of house is also changed. And thus the different periods create different cultures of the house and will continue to create them. Thus we can say that culture and identity have an outstanding importance in creating residential areas in Iran in addition to postmodern theories and in creation of such areas, both theories are used beside each other. The result of using these theories is that it can change the style of the house and even the relations inside the house and this is a point to which people pay less attention.

CONFLICT OF INTEREST

There is no conflict of interest

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REFERENCES

- [1] Greuther, Jörg Kurt. [2007] Aesthetic in Architecture, the Translation of the JahanshahPakzad and AbdulrezaHomayun. _ Tehran, ShahidBeheshti University
- [2] Fakouhi, Nasser. [2007] Urban Anthropology._ Tehran: Reed Publication
- [3] Behzadfar M. [2007] the Identity of the City (A Look to the Identity of Tehran)._ Tehran: The Culture and Art Organization of Tehran Municipality. City Publication Institute
- [4] Zarkesh A. [2010] Compatibility of Space and Structure in Architecture. The Doctoral Thesis of Architecture Tehran University
- [5] Mir Miran, Hadi. [2009] The Search for National Identity in Architecture Today Architect Journal. 26
- [6] Gharabaghi, Ali Asghar. [2011] Postmodern Genealogy._ Tehran: Cultural Research Office
- [7] Relativity Kate. [2012] Postmodern Theories in Architecture. MohamdrezaShirazi. Tehran: Reed Publication.
- [8] Exner U, Pressel D. [2009] Basics Spatial Design. Berlin: Birkhäuser Press.
- [9] Forayama, Masao. [2009] Analysis of Works, Ideas and Points of View. D: Hamid Mohammadi and Mohammad Ali Ashraf Ganjavian. Isfahan: the Soil Publication.
- [10] Shahcheraghi A. [2008] World without Borders, Area without Borders. *Journal of Architecture and Urban Planning* 70 and 71
- [11] Schulze F. [2009] Building a Masterpiece: Milwaukee Art Museum. Spain: Hudson
- [12] Ward, Glenn. [2011] Postmodernism, Translation by GhaderFakhrRanjbari and BouzarKarami._ Tehran: Fish Publication, Second Edition Hills Press.
- [13] Nozari, Hosseinali. [2012] Role of Postmodernism and Postmodernity. - The Publication of Role of the World
- [14] Jahangiri, Daneshpur, Rafiei, Mohsen, Abdulhadi, Amirreza. [2006] Postmodernism and New Perspectives in City and Urban Development, *Philosophical Journal of Faculty of Literature of Tehran University*, No. 12
- [15] Ostrovsky V. [2010] Urban Contemporary, E'tezadi Laden, Tehran University Publication Center
- [16] Haidegger, Martin. [2009] Being and Time: New York.
- [17] Madanipour Ali. [2008] Public and Private Areas of the City, the Translation of FarshadNourian. - Tehran: Processing and Urban Planning Company
- [18] HaeriMazandarani, Mohammad Reza. [2008] House, Culture, Nature. Tehran: Center for the Study and Research of Urban Planning and Architecture
- [19] Rybczynski, Witold. [2007] Home A short History and Idea: Penguin Books-
- [20] Fakouhi, Nasser. [2006] Identity and Lack of Urban Identity, *Quarterly of Anthropology*, Third Year. 4

ARTICLE

THE EFFECT OF THE CRITERIA OF NEED AND CAPACITY IN GOVERNMENT'S BUDGET APPROPRIATIONS ON ECONOMIC DEVELOPMENT OF IRAN'S PROVINCES

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ABSTRACT

This study aims to evaluate government's policies of budget appropriation to provinces. It seeks to estimate the effect of considering provinces' capacity and needs in government's budget appropriation on their economic development. First, the two criteria of provinces' need and capacity are defined and accordingly, indices are proposed for government's budget appropriation to provinces. Then, the provincial data of 2000 to 2009 were collected and the trends and differences were analyzed. The growth model was estimated using panel data econometrics. Gross domestic production and its growth was the dependent variable, and capital stock, labor, the two criteria of provinces' need and capacity in the government's budget appropriation were explanatory variables. The main results are that when the government's budget appropriation exceeds the capacity of the province, it has a negative effect on its production and growth, but if budget appropriation to needy provinces is more than their need, it has a positive effect on their economic growth.

INTRODUCTION

Traditional growth theories consider economic capacities, such as capital, labor and natural resources as the growth and production factors. In contrast, the new theories give more importance to human factors such as empowerment. In Iran, government's budget appropriation to provinces is less based on scientific theories. It is very important, from theoretical applied views, to deal with the issues that what is the effect of such budget appropriation on province's economic growth and in addition, if scientific traditional criteria or new knowledge are applied for budget appropriation, what changes are made in the government's budget appropriation effects' on economic growth of provinces. Accordingly, this study seeks to estimate the effect of considering provinces' capacity and needs in government's budget appropriation on their economic development, with regard to the two aforementioned growth theories. In this study, a brief review of literature is provided, then, the two evaluation criteria for government's budget appropriation to provinces based on their needs and capacity are defined and indices are proposed for them. The provincial data of [2000] to [2009] are collected and the trends and differences are analyzed. The growth model is estimated using panel data econometrics with the application of Eviews software. The main finding of this study is that when the government's budget appropriation exceeds the capacity of the province, it has a negative effect on its production and growth. In addition, if budget appropriation to needy provinces is more than their need – to meet their basic needs-, it has a positive effect on their economic growth.

KEY WORDS

Budget, capacity, need, economic growth, regional economy

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Research background

In this section, a brief review of growth theories and some of the empirical studies are provided.

Economic growth theories

Different theories have been raised on the determinants of economic growth, which can be divided into three groups of classical growth theories, neoclassical growth theories and endogenous growth theories. In addition to these groups, new theory of development can be considered as the fourth group.

David Hume and Adam Smith are the pioneers of the idea of growth in classical school. Adam Smith believes that specialization and division of labor is the engine of growth. The classical economists also believed that natural resources are the main constraint of growth opportunities.

The second category is neoclassical growth theories. Neoclassical theories consider advancement of technology as the exogenous factor of production growth and capital accumulation as the endogenous factor of production growth. The neoclassical view of growth theory was proposed by Solow [1956] and Sowan [1956] in the 1950s. The basic feature of the Solow-Sowan model is the figure of the production

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function. The assumptions of this function include constant returns to scale, diminishing returns for each input and elasticity of positive substitution between production inputs.

The third category of growth theories is known as the endogenous growth. Endogenous growth theory, which was proposed on the basis of experimental and theoretical researches in the 1980s, rejects classical and neoclassical theories about ideal markets and diminishing returns, especially in the capital. The main thinkers in this category are Arrow [1962], Romer [1986], Lucas [1988], Grossman [1987] and Helpman [1998]. They believe that factors such as increased efficiency of research and development and transfer of knowledge and information, learning from experience, dispersion of technology, social capital, religion and other variables affect economic growth. In addition to these endogenous growth theories, human-oriented development theories, which considered human as the aim of development and also considered human empowerment as the way were proposed by eastern thinkers such as Jamal al-Haq and AmartyaSen and can be considered against the classical theories. Based on the economic growth models from Yang, Harrod-Domar, Solow- Sowan, Kaldor, Arrow, Romer, Lucas, AmartyaSen to 21st century, great transformations have occurred in terms of factors influencing the growth, endogenous and exogenous variables such as human capital, type of production function, increasing or decreasing effect of inputs, definition of capital and the separation of physical and human capitals and political variables. In other words, in the past six decades, there have been four waves of growth theories that the present study compares the third wave based on the first wave with the fourth wave.

Empirical studies

There is no experimental study on the effect of government's budget appropriation based on need and capacity in the literature on economic growth. However, there have been studies on factors affecting economic growth, especially economic growth in Iran that will be mentioned here.

Ebrahimi, Mohsen and Ali Soori [1] assessed the effect of loss of oil revenues uncertainty on economic growth and the need for foreign exchange reserves. Rahmani, Abbasi Nezhad and Amiri [2] estimated the effect of social capital on economic growth of Iran in a regression model with econometric methods. Boroumand [3] estimated the effect of corruption and private sector investment on economic growth of Iran in a regression model with econometric methods. Ezzati and Agheli [4] estimated the effect of religious capital on economic growth of Iran's provinces in a regression model with econometric methods. Ebrahimi, Mohsen and Mohammad Salariyan [5] examined the natural resource curse phenomenon in Petroleum Exporting Countries (OPEC) and the effect of presence in OPEC on the economic growth of its member states using econometric methods. Abrishami, Mehr-Ara and Zamanzadeh Nasrabadi [6] investigated the relationship between oil shocks and economic growth in OPEC member states in an econometric models. Sabahi and Malekosadati[7] examined the control effect of financial corruption on economic growth using econometric methods. Mehr-Ara and MakkiNayeri[8] estimated the mean of Iran's oil revenues and economic growth using threshold of non-linear relationship. Mehr-Ara, and Miri[9] estimated the relationship between oil revenues and value-added of different economic sectors in the oil exporting countries of Iran, Mexico and Venezuela. Ezzati, Shahriari, Najafi and Shafie [2013] investigated the effect of inter-regional economic discrimination on economic growth of Iran's provinces.

The two indices of criteria for budget appropriation among the provinces on the basis of capacity and need

In this study, two different indices have been created for the criteria of budget appropriation among the provinces on the basis of capacity and on the basis of needs. To create these indices, it is appropriate to clarify the criteria of budget appropriation among the provinces on the basis of capacity and on the basis of needs. These criteria are:

1. Needs of provinces: today, work, education and health (wellness) are known as three basic human needs.
2. Growth capacity of provinces: resources (area), production and population are known as three basic factor for creation of capacity of an area.

Accordingly, the criteria of budget appropriation among provinces can be indexed using the following sub-criteria.

The how of measurement of the sub-indices of the two indices for the criteria of budget appropriation among provinces

It can be said that the capacity of an area (a province) is composed of human resources in the province, the work done in the province and the province's environment and land resources. According to the available data, three variables can be considered to determine the capacity of each province: first, population; second, economic activities that can be measured using value added; and third, area (extent) of the province. The indices of this study, in the form of six sub-indices of the criteria of budget appropriation among provinces on the basis of capacity and needs, are defined as follows:

- The ratio of the proportion of the current costs of government in each province compared to the current expenses of the government in the country over the proportion of the population of each province in the country
- The ratio of the proportion of the capital costs of government in each province compared to the capital expenses of the government in the country over the proportion of the population of each province in the country
- The ratio of the proportion of the current costs of government in each province compared to the current expenses of the government in the country over the proportion of the breadth of each province in the country
- The ratio of the proportion of the capital costs of government in each province compared to the capital expenses of the government in the country over the proportion of the breadth of each province in the country
- The ratio of the proportion of the current costs of government in each province compared to the current expenses of the government in the country over the proportion of the value added of each province from the total of value added in the country
- The ratio of the proportion of the capital costs of government in each province compared to the capital expenses of the government in the country over the proportion of the value added of each province from the total of value added in the country

The average of these six indices is the index of the criteria for the budget appropriation among the provinces on the basis of capacity.

It can be said that the needs of an area (province) are composed of unemployment, illiteracy and life expectancy (health indicator). According to the available data, three variables can be considered to determine the needs of each province. The indices of the need criterion in this study is defined in the form of six indices as follows:

- The ratio of the proportion of the current costs of government in each province compared to the current expenses of the government in the country over the proportion of the illiterate people of each province in the country
- The ratio of the proportion of the capital costs of government in each province compared to the capital expenses of the government in the country over the proportion of the illiterate people of each province in the country
- The ratio of the proportion of the current costs of government in each province compared to the current expenses of the government in the country over the proportion of the unemployed people of each province in the country
- The ratio of the proportion of the capital costs of government in each province compared to the capital expenses of the government in the country over the proportion of the unemployed people of each province in the country
- The ratio of the proportion of the current costs of government in each province compared to the current expenses of the government in the country over the reverse proportion of the life expectancy of each province in the country
- The ratio of the proportion of the capital costs of government in each province compared to the capital expenses of the government in the country over the reverse proportion of the life expectancy of each province in the country

The average of these six indices is the index of the criteria for the budget appropriation among the provinces on the basis of needs.

Based on what was said, the index of the criteria for budget appropriation among the provinces has been measured and the results are shown in the following two tables. The amounts less than one indicate a relative appropriation of budget more than the province's capacity or relative needs. The amounts above one represent a relative appropriation of budget more than the province's capacity or relative needs.

Analysis of the budget appropriation among the provinces

Based on what was said, the index of the criteria for budget appropriation among the provinces during 2000 to 2010 has been measured and the results are shown in the following tables and figures.

Based on these measurements, it can be seen that some of the indices are in a better status in some provinces and some are in a worse status. This is because the provinces are not homogeneous in terms of economic, population and natural capacities. On this basis, none of these sub-indices can be alone used as a criteria to show the capacity. To improve the analytical power of indicator on the basis of capacity, the mean of these indices has been used. Provinces are divided into three categories based on these indices: one-third of the provinces (10 provinces) that have the highest index are considered as provinces that have been allocated budget more than the relative capacity. One-third of the provinces (10 provinces) that have the lowest index are considered as provinces that have been allocated budget less than the relative capacity. One-third of the provinces (10 provinces) that have the mean index are considered as provinces that have been allocated budget according to the relative capacity.

The size of the sub-indices and the index of the criteria of budget appropriation among provinces on the basis of their needs shows a different results. Based on the aforementioned points, provinces are divided into three categories. The provinces that have been allocated less than their needs are Ardabil, Chaharmahal and Bakhtiari, Zanjan, Qom, Qazvin, West Azerbaijan, Golestan, Hamedan, Lorestan and Kurdistan. The provinces that have been allocated more than their needs are Khuzestan, Bushehr, Kerman, Fars, Semnan, Isfahan, Yazd and Mazandaran and East Azerbaijan.

If we look at two indicators, the Bushehr on the basis of both indexes more than its share of the budget is allocated. The plant has a very high share in the allocation of funds. Besides that, based on both criteria, for the provinces of West Azerbaijan, Ardebil and less than their share of the budget is allocated. For other provinces in each of these two criteria alone has allocated less funding has been allocated more funds in the index. And this reflects been allocated to them by other criteria.

If we look at two indices, Bushehr has been allocated more budget based on both indices. However, plant has had a very important role in the budget appropriation. Besides that, based on both criteria, less budget has been appropriated to the provinces of West Azerbaijan and Ardebil. For other provinces that have been allocated less budget in terms of each of these two criteria, have not been allocated more budget in the other criterion; and this reflects budget appropriation based on other criteria.

To show the composition of these two indices, the average of the two has been taken into account. The mean shows that the provinces that have been allocated the least budget on the basis of these criteria are KhorasanRazavi, Ardabil, Isfahan, West Azarbaijan, and Qom, Markazi, South Khorasan, Qazvin, East Azarbaijan and Golestan provinces, respectively. Province with the highest allocation of budget more than their capacity and needs are Khuzestan, Bushehr, North Khorasan, Gilan, Kohgiluyeh and Boyer-Ahmad, Kermanshah, Semnan, Kerman, Kurdistan and Ilam, respectively.

To wrap it up, it is worth mentioning that some other factors should be considered as the criteria here. Such factors are that some provinces have special status. For example, border cities should be appropriated more budget according to the security and other needs. Similar to these factors, other factors can be also taken into account and the result of other conditions can be achieved.

However, budget appropriation among the provinces needs to be revised to shape a better balance in the allocation of facilities among the provinces. The criteria of the need for empowerment such as education, health and employment (unemployment) are the best criteria based of the new definitions of justice and theories of development that should be the main criteria in the budget appropriation among the provinces. The economic criteria of production capacity, resource capacity and human capacity are also the most important criteria of provinces' capacity that can well affect the growth and development of the provinces. To better represent differences of the two criteria, a few figures are shown below.

Table 1: The criteria of budget appropriation among provinces in 2010

No.	Province	The mean of need indices	The mean of capacity indices	The composite index
1	KhorasanRazavi	1.046048	0.899295	0.97
2	Ardabil	0.580823	1.396854	0.99
Provinces that have	Isfahan	1.286724	0.775917	1.04

4	been appropriated less budget based on the composition of criteria	West Azarbaijan	0.804591	1.293309	1.05
5		Qom	0.764233	1.456979	1.06
6		South Khorasan	#DIV/0!	1.377691	1.07
7		Markazi	0.955064	1.179099	1.07
8		East Azarbaijan	1.102563	1.203542	1.15
9		Qazvin	0.773767	1.517486	1.15
10		Golestan	0.826543	1.555059	1.19
11	Medial Provinces	Zanjan	0.724051	1.490664	1.21
12		Chaharmahal and Bakhtiari	0.692967	1.758701	1.23
13		Hamedan	0.839929	1.630121	1.24
14		Yazd	1.259869	1.209053	1.24
15		Lorestan	0.853686	1.650398	1.25
16		Sistan and Baluchistan	0.882522	1.639072	1.26
17		Fars	1.405772	1.137933	1.27
18	Provinces that have been appropriated more budget based on the composition of criteria	Hormozgan	1.152893	1.40645	1.28
19		Mazandaran	1.07757	1.527744	1.30
20		Ilam	0.892321	1.777373	1.34
22		Kurdistan	0.859916	1.901169	1.39
23		Semnan	1.313218	1.515863	1.41
24		Kerman	1.572875	1.250623	1.41
25		Kermanshah	0.982607	1.917331	1.45
26		Kohgiluyeh and Boyer-Ahmad	0.996869	1.531941	1.46
27		Gilan	0.945666	2.15278	1.55
28		North Khorasan	#DIV/0!	1.399631	1.82
29		Bushehr*	1.610947	2.069733	1.84
30		Khuzestan*	2.331258	1.519928	1.90
31		Tehran*	1.79907	2.545134	2.17

* Tehran, Khuzestan, and Bushehr are special provinces for which the reason of greater budget appropriation is something else. Most national and staff budgets are appropriated to Tehran, but they are spent for the country or other provinces. Khuzestan is a war zone and has its own specific problems. Bushehr is the investment priority because of its plants and special situation of Assaluyeh.

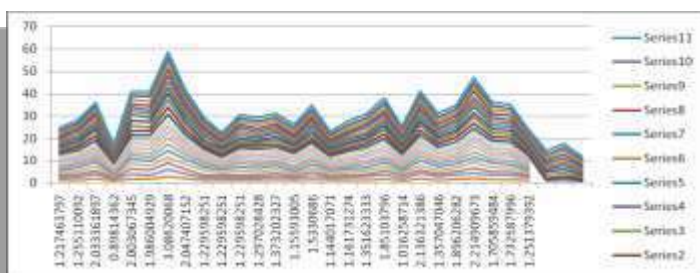


Fig. 1: comparison of 30 provinces in terms of the index for the criteria of budget appropriation based on capacity in 11 years (2000-2010)

Series are from year 2000 to 2010, respectively

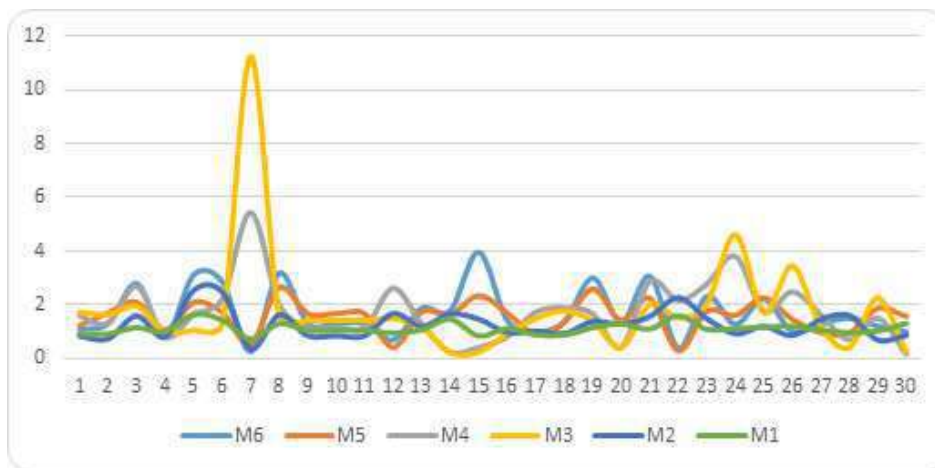


Fig. 2: the criteria of budget appropriation among provinces based on 6 sub-indices of capacity in 30 provinces in 2000

M1: The ratio of the proportion of the current costs of government in each province compared to the current expenses of the government in the country over the proportion of the population of each province in the country

M2: The ratio of the proportion of the capital costs of government in each province compared to the capital expenses of the government in the country over the proportion of the population of each province in the country

M3: The ratio of the proportion of the current costs of government in each province compared to the current expenses of the government in the country over the proportion of the breadth of each province in the country

M4: The ratio of the proportion of the capital costs of government in each province compared to the capital expenses of the government in the country over the proportion of the breadth of each province in the country

M5: The ratio of the proportion of the current costs of government in each province compared to the current expenses of the government in the country over the proportion of the value added of each province from the total of value added in the country

M6: The ratio of the proportion of the capital costs of government in each province compared to the capital expenses of the government in the country over the proportion of the value added of each province from the total of value added in the country

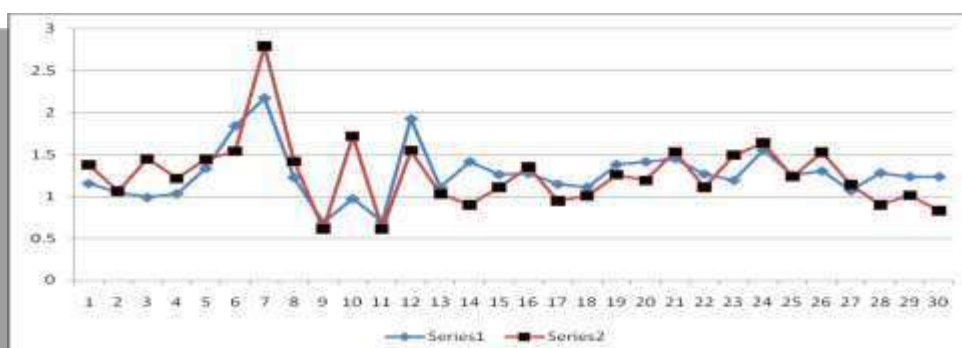


Fig. 3: The composite criteria of budget appropriation among 30 provinces in two years of 2000 (blue) and 2010 (red)

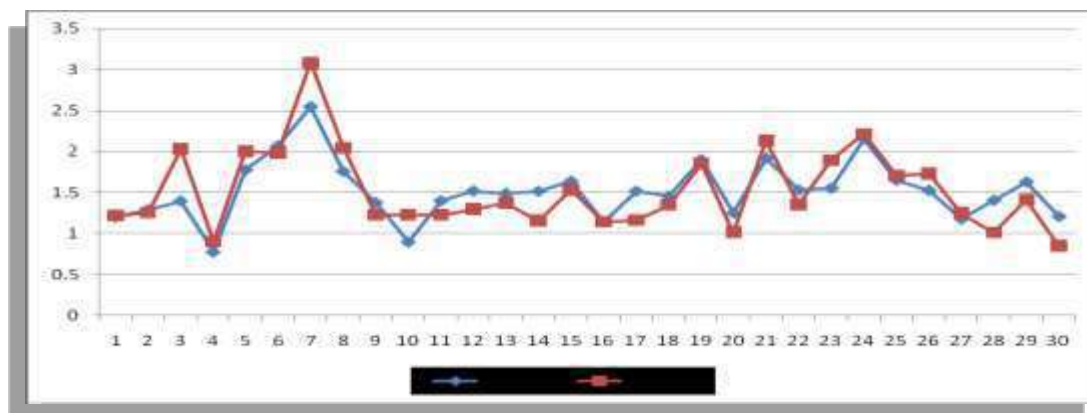


Fig. 4: The criteria of budget appropriation among provinces based on capacity in 30 provinces in two years of 2000 (blue) and 2010 (red)

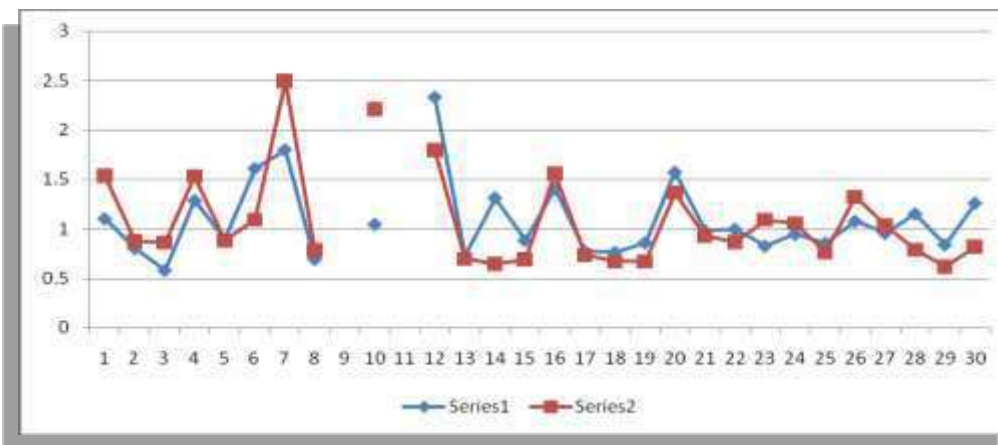


Fig. 5: The criteria of budget appropriation among provinces based on needs in 30 provinces in two years of 2000 (blue) and 2010 (red)

Research models and its variables

The model used in this study to investigate the effect of the criteria of budget appropriation among economic provinces on economic growth is based on endogenous economic growth models. Based on the overall growth model, the framework of this model is a function of the two main variables of capital and labor, which is emphasized in all growth theories. The difference is that in the present model, the variable added to the two variables of capital and labor is an endogenous variable including several sections. Here, the variable indicating the size of the indices of criteria for budget appropriation among provinces includes 12 section. The indices of the criteria of budget appropriation among provinces is entered into the model as a variable and then, each of the indices of the criteria of budget appropriation based on capacity and based on needs are entered into the model and analyzed together.

Similar to many studies conducted in economic growth and factors affecting it, the relationship

$$y = c + \alpha K_{it} + \lambda L_{it} + \beta M_{it}$$

Where, y is the value of gross domestic production, M is the index of the criteria of budget appropriation among provinces, L is labor, and K is the capital stock of the province. To show GDP growth in the model, the logarithm of (y) is entered into the model. The variables of the model and the how of their measurement is described here.

The variable of the value of GDP

In this study, the variable of the value of GDP is obtained from data base of the Statistical Center of Iran.

The variable of the criteria for budget appropriation among provinces

Two indices were created for the criteria of budget appropriation among provinces based on needs and capacity and they were explained earlier.

The variable of capital

In our model, the variable k represents capital. Capital stock is not measured and estimated in the statistics of the statistical Centre and the Central Bank of Iran, as the country's official statics centers; therefore, we should estimate provincial capital stock. In this study, capital stock is measured through the following process:

1. The value of the development budget in each province is available from 1986 to 2010. The values in the years 1991 to 2000 are added up to obtain governmental capital accumulation in each province by the year 2000. Then the proportion of each province is measured. The value of development budget of other years is similarly measured for each province's proportion. Since the statistics related to private investment in provinces are not available, it is assumed that the proportion of private investment follows governmental investments each year.
2. The proportion of each province in 2000 is multiplied by the capital stock of the country in 2000 in order to obtain the total capital stock of each province in this year.
3. For 2001-2010, the increase of country's capital stock is measured for each year to obtain the increase of capital stock for the whole country.
4. The proportion of each province from the capital stock of the government for the years 2001-2010 (obtained in step 1) is multiplied by the increase in the capital stock of the whole country for the years 2001-2010 in order to obtain the increase of capital stock of each province in these years.
5. In 2001, the capital stock of 2000 (which was obtained in step 2) is added to the increase of capital stock in 2001 (which was obtained in Step 4) for each province in order to obtain the capital stock of each province in 2001.
6. For other years, the capital stock of the previous year is added to the increase of capital stock of the year for each province so as to obtain the capital stock of the year for each province.

The variable of labor

The number of workers is not specified for all years of the period under study. A document entitled a survey of employment and unemployment features was carried out during 2003 and 2000 and a document entitled a survey of the labor force was carried out during 2006-2007. Since these surveys have been done on different samples across the country, they are not consistent and the results can't

be used. Accordingly, the results of national census on household characteristics in 1996 and 2006 have been used to determine the number of work force in each province and then the number of work force for other years has been calculated accordingly. To determine the size of the labor force of each province during the period under study, the following steps have been taken:

1. First, the difference between these two numbers of the labor force for each province in 1996 and 2006 is divided by 10 to calculate the increase in the labor force every year.
2. The number of workers in 1996 is added to the amount increase of each province in order to obtain the number of labor force in the province in 1997.
3. In order to obtain the number of work force for the next year, the number of work force in the previous year is added to the amount of increase in the number of work force.

Model estimation

First, the preliminary tests of data is mentioned and then, the model estimation and their results are analyzed.

Because our data are cross-sectional time series (2001-2007) and the time series is only for seven years, there is no need to check whether data is stationary or non-stationary¹.

Hausman test is used to see whether the model should be estimated using fixed effect method or random effect method. Based on the test results, the estimated alpha is between .65 and .89, which means that the random effect method is unacceptable and fixed effect method is accepted to estimate the models.

In order to investigate the effect of the index of the criteria of budget appropriation among provinces on economic growth, the overall economic growth model is estimated using the two factors of labor and capital and then the two indices of the criteria of budget appropriation among provinces based on capacity and need are separately entered into the model and the model is estimated to see how much they have added the explanation of the model. Such estimations, associated with capital and labor, can show the effect of the indices of the criteria of budget appropriation among provinces on economic growth. In other words, if a comprehensive model is indicative of the effect of labor and capital, entering the indices of the criteria of budget appropriation can show the effect of the criteria of budget appropriation among provinces through the improvements or disorders in human capital and social capital as well as economic stability.

If based on the economic growth theories, we consider capital and labor as two main factors of production and enter other factors such as indices and variables of the criteria of budget appropriation among provinces as the affecting factors, the estimated effect can be analyzed separately. For comparative analysis of these variables, the growth model was first estimated based on two variables of capital stock and labor. The results are listed as zero pattern in the second column of [Table 2]. The results show that these two variables explain 71% of growth changes. Each indices of the criteria of budget appropriation among provinces based on capacity and need were separately entered into the model and estimated to see which of these two variables has a greater or less effect. The results of estimations are presented in [Table 3] under the columns of patterns two to four. The results show that the explanatory power of models is very close to each other and there would be no priority among them. When the two indices of the criteria of budget appropriation among provinces based on capacity and need are simultaneously entered into the model and the model is estimated, the results show that the coefficient of the variable of the criteria of budget appropriation among provinces based on capacity is not so significant (pattern two). In order to have a more detailed analysis, these two indices were separately entered into the two models and then, estimation is done. Given the significance level of estimated coefficients of these indices, it can be said that the separate effect of both of these indices is accepted although the effect of the index of the criteria of budget appropriation among provinces based on needs is more significant.

The analysis of the results of the estimations shows that in all estimations, the variables of capital stock and labor are in a good significance level. As can be seen in the results of the estimations, they have a positive effect on GDP growth. In order to have a more detailed analysis, the effect of changes in appropriation on changes in production, i.e. growth variable was entered into the model and the results are given in [Table 2]. With the same above mentioned assumptions, the two indices of the criteria of budget appropriation based on capacity and needs are separately entered into the model as two

different variables and then, estimation was done to see which has a greater or less effect. The results of estimations are presented in [Table 3] under the columns of patterns two to four. The results show that the explanatory power of models is very close to each other and there would be no priority among them.

When the two indices of the criteria of budget appropriation among provinces based on capacity and needs are simultaneously entered into the two simple and logarithmic models and models are estimated, the results show that the coefficient of the variable of the criteria of budget appropriation among provinces based on capacity is negative. According to the definition provided for this coefficient, it can be said that appropriation of budget more than the capacity of the province means that the proportion of the appropriated budget to the province is more than the proportion of its capacity compared to the economic capacity of the country. The negative sign of this index means that the budget appropriated to the province is less than the economic capacity of the province compared to the whole economic capacity of the country. The negative sign of this index means that the amount of budget that is appropriated more than the capacity of the province does not increase the production and growth of the province, rather it increases deficiencies and decreases production and growth since the capacity of the province is less than the appropriated budget and the inability for absorption, i.e. reduction of returns compared to the scale and other human and social effects. In contrast, the index of the criteria of budget appropriation among provinces based on needs is positive and it means that if needs are satisfied, there would be a positive effect on production. It can also mean that the indices of budget appropriation based on needs shows greater human capital deficiencies and appropriation of such budgets can meet the needs and increase the capital. In addition, increase in the budget appropriation can be considered as a tool for people's empowerment, which in turn, increases human and social capital. It can also be implied that one of the barriers of growth in provinces is the shortcomings entered into the model in the framework of needs.

Table 2: The results of estimating models for the effect of the index of the criteria of appropriation on GDP

	Pattern 1	Pattern 2	Pattern 3	Pattern 4
Variable	GDP	GDP	GDP	GDP
Intercept	-34243660 (-4.665619)	-4.14E+08 (-17.43773)	-4.29E+08 (-19.92788)	-3.70E+08 (-15.50985)
Labor (L)	120079.4 (18.76675)	536053.3 (29.49221)	536513.3 (29.42843)	507899.2 (27.31945)
Provincial capital (K)	306.5101 (2.257)	680.0438 (2.338440)	666.8064 (2.286656)	815.2857 (2.669065)
The index of budget appropriation based on capacity		-19948942 (-1.580605)		23116077 (2.088480)
The index of budget appropriation based on needs		9115211 (6.000246)	77728000 (6.151670)	
R ²	0.7147	0.962215	0.961815	0.956404
F-statistics	61.95	150.2460	153.0667	129.4881
D-W statistics	0.093	0.607622	0.594747	0.493208

Table 3: The results of estimating models for the percentage of growth changes per percentage of changes in the index of appropriation criteria

	Pattern 2	Pattern 3	Pattern 4
Variable	Log(GDP)	Log(GDP)	Log(GDP)
Intercept	-9.202842 -12.68802	-9.831921 -13.66345	-9.438611 -13.25558
Log of labor (L)	0.829162 3.548674	0.866710 3.628945	1.069818 4.555984
Log of provincial capital (K)	2.024179 13.59890	2.035586 13.36838	1.896138 12.71180
Log of the index of budget appropriation based on capacity	-0.709257 -3.543223		-0.297704 -1.938562

Log of the index of budget appropriation based on needs	0.497290 2.965941	0.104005 0.808851	
R²	0.953435	0.951049	0.949640
F-statistics	161.8226	159.3153	147.9107
D-W statistics	0.540809	0.463591	0.580903

CONCLUSION

Findings

One of the government's tools to achieve better development of areas is the state budget. There are two basic views regarding the development policies. The first is traditional view, which believes that capital should be appropriated where has more economic capacity. In contrast, there is a newer view that states that if human being are empowered, better development occurs. Therefore, funds should be used to empower people to make better and faster development. In this study, it was tried to design and develop an index for the criteria of budget appropriation among provinces and then estimate its effect on the economic growth of provinces during an 11-year period from 2001 to 2011.

Based on what was said, the index of the criteria of budget appropriation among provinces was designed and then measured for years 2000 to 2011. The results were presented in section 2.

Sub-indices and composite index of the criteria of budget appropriation among provinces based on capacity shows that some provinces are in a better status in some indices and some are in a worse status in others. This is because the provinces are not homogeneous in terms of economic, population and natural capacities. On this basis, none of these sub-indices can be alone used as a criteria to show whether the province should be appropriated more or less than capacity or needs. To improve the analytical power of indicator on the basis of capacity, the mean of these indices has been used. Provinces are divided into three categories based on these indices: one-third of the provinces (10 provinces) that have the highest index are considered as provinces that have been allocated budget more than their relative capacity or needs. One-third of the provinces (10 provinces) that have the lowest index are considered as provinces that have been allocated budget less than their relative capacity or needs. One-third of the provinces (10 provinces) that have the mean index are considered as provinces that have been allocated budget according to their relative capacity or needs.

The data of the index of the criteria of budget appropriation among provinces based on capacity showed that budget appropriation to Isfahan, KhorasaneRazavi, Fars, Markazi, East Azarbaijan, Yazd, Kerman, West Azarbaijan, South Khorasan and Ardebil is less than their relative economic capacity and budget appropriation to Gilan, Bushehr, Kohkiloye and Boyer Ahmad, Kermanshah, Kurdistan, Ilam, Chaharmahal and Bakhtiari, Lorestan, Hamedan and Sistan-Baluchistan has been more than their relative capacity.

The data of the index of the criteria of budget appropriation among provinces based on needs shows different condition if provinces are divided to three aforementioned categories. The provinces that have been appropriated less budget just based on their needs are Ardebil, Chaharmahal and Bakhtiari, Zanjan, Qom, Qazvin, West Azerbaijan, Golestan, Hamedan, Lorestan and Kurdistan. The provinces that have been appropriated more budget just based on their relative needs are Khuzestan, Bushehr, Kerman, Fars, Semnan, Isfahan, Yazd, Mazandaran and East Azerbaijan.

It is again worth mentioning that some other factors such as the special position of the province should be considered as the criteria. Other factors can be also taken into account and the result of other conditions can be achieved. Investigation of the effect of such budget appropriation on economic growth shows that government's criteria for budget appropriation can affect the economic growth of provinces. Empirical estimations show that ignoring needs in the appropriation of provincial budget is of great importance for growth and needs should be satisfied to improve growth. One could even say if budget appropriation is more than needs, economic growth and production increase speeds up until equality of needs' satisfaction occurs. It can be implied that production growth of provinces is more sensitive to human needs rather than capacities. This is in line with the latest theories and findings of development that empowerment and need satisfaction are more important in achieving development. These views were first proposed with the theory of human development proposed by Jamal Al-Haq and meeting basic needs or human empowerment theory proposed by AmartyaSen and they have entered into the UN

human development index in recent years.

To improve the development of the provinces and also a better use of budgets, distribution of budgets among the provinces should be revised so as to have a better allocation of resources among the provinces. The criteria of the need for empowerment, such as education, health and employment (unemployment) are the best measures based on the new definition of development and justice that should be the main criteria in the budget appropriation among the provinces. Accordingly, in order to improve the growth in Iran, human needs should be the criteria of budget appropriation among provinces and then, capacities should be taken into account. In this way, budget appropriation is consistent with the justice associated with the growth asked in national aspirations and it is also in line with the latest theory of harmonious growth.

Suggestions

Based on the findings of this study, the distribution of budget among the provinces should be revised in order to improve economic growth of Iran and to better balance the allocation of resources among the provinces. The criteria of the need for empowerment, such as education, health and employment (unemployment) are the best measures based on the new definition of development and justice that should be the main criteria in the budget appropriation among the provinces. Accordingly, in order to improve the growth in Iran, human needs should be the criteria of budget appropriation among provinces and then, capacities should be taken into account.

CONFLICT OF INTEREST

There is no conflict of interest

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None

FINANCIAL DISCLOSURE

None

REFERENCES

- [1] Ebrahimi M, Soori A. [2005] The effect of the loss of uncertainty of oil revenues on economic growth and the need for reserve account, *Mofid Journal*. 48:43-54.
- [2] Rahmani T, Abbasi Nezhad H, Amiri M. [2007] Investigating the effect of social capital on economic growth of Iran, *Quarterly journal of Economic Research*, summer.
- [3] Boroum Sh. [2008] Corruption, private sector investment and economic growth (Case study: Iran), *Journal of Quantitative Economics* (former economic studies). 5(2).
- [4] Ezzati M, Agheli L. [2008] Religious capital: nature, constituent elements and its implications. *Proceedings of the International Conference on Islamic Economics and Development*, Faculty of Economic and Administrative Sciences, Ferdowsi University.
- [5] Ebrahimi M, Salariyan M. [2009] Investigating the phenomenon of natural resource curse in OPEC member states and the effect of presence in OPEC on member states' growth. *Quarterly journal of Quantitative Economics* (former economic studies). 6(1):77-100.
- [6] Abrishami H, Mehr-Ara M, Zamanzadeh Nasrabadi H. [2009] The relationship between oil shocks and economic growth in OPEC countries: is this relationship is asymmetric? *Quarterly journal of Energy Studies*. 21:93-112.
- [7] Sabahi A, Malekosadati S. [2009] The effect of financial corruption control on economic growth, *Quarterly Journal of Commerce*. 53:131-158.
- [8] Mehr-Ara M, MakkiNayeri M. [2009] Investigating non-linear relationship between oil revenues and economic growth using a threshold method (Case: Iran). *Quarterly Journal of Energy Economics Studies*, 6th edition. 22:29-52.
- [9] Mehr-Ara M, Miri A. [2010] The relationship between oil revenues and value-added of different economic sectors in the oil exporting countries: Iran, Mexico and Venezuela. *Journal of Economic Research*. 90:183-206.
- [10] Ebrahimi M, Salariyan M, Haji-Mirzaei MA. [2008] Investigating the influential mechanism of oil revenues on economic growth of Petroleum Exporting Countries from the perspective of the natural resource curse, *Energy Economics Studies*, Fifth ed. 16.
- [11] Straiton P. [2003] *Pioneers of Economic Development: future prospects*, Edited by Gerald Mayer and Joseph Stiglitz, translated by Azad GhR. (Armaki), Tehran: Ney Publication, 1sted.
- [12] Bourdieu P. [2005] *Forms of capital*. Collected by Tajbakhsh K. Translated by Khakbaz A, Pooyan H. Tehran: Shiraze publication.
- [13] Putnam R. et al. [2005] *Social capital, trust, democracy and development*. Collected by Tajbakhsh K. Translated by Khakbaz A and Pooyan H. Tehran: Shiraze publication.

- [14] Pour Mousavi F. [2002] Civil society and social capital. *Journal of Rahbord*. 26.
- [15] Haji-Yousefi AM. [1999] Government, oil and economic development in Iran. Tehran: Centre for Islamic Revolution Documents.
- [16] Khani F, Mardani AM. [2008] Development and Human Poverty and the Gender Index, *Journal of Women's studies*. 6(4):75-108.
- [17] Rahnama M. [2003] To the post-development era: Search for guides in government, corruption and social opportunities; interaction of ideas in political economy. Edited and translated by Raghfar, H. Tehran: NaghshoNegar Publications, 1st edition. 368-397.
- [18] SardarniaKh, Ghodrati H, Islam A. [2009] Effects of Good Governance and social capital on political trust. *Journal of Political Science*. 1:135-165.
- [19] Sen A. [2002] Development as Freedom. Translated by Mahmoudi V. Tehran: Dastan publications, 1st edition.
- [20] Share Poor M. [2000] Study of social capital and its maintenance. The book of Social Sciences. 36.
- [21] Share Poor M. [2001] Erosion of social capital and its consequences. Iranian Sociological Association. 3.
- [22] Seydaui E, AhmadiShapoorAbadi MA, MoeinAbadi H. [2009] The history of social capital and its relationship with social development components in Iran. *Journal of RahbordeYas*. 19:188- 225.
- [23] Ezzati M. [2010] Religion and Development: Investigating the influence of religion on development. Kheradnameh. 60.
- [24] GhaffariGh, Tajedin MB. [2005] Identify the components of social exclusion. 4th edition, 17:33-55.
- [25] Hadian E, Parsa H. [2006] Investigating the effect of oil price fluctuations on macroeconomic performance in Iran. *Journal of Humanities and Social Sciences*, 6th edition, 111-132.
- [26] Yavari K, Salmani B. [2005] Economic growth in countries with natural resources: A case of oil-exporting countries. *Journal of Commerce*. 37.
- [27] Barro, Robert J, Rachel M, McCleary. [2003] Religion and Economic Growth, *American Sociological Review*. 68: 760-781.
- [28] Dollar, David, Gatti, Roberta. [1999] Gender Inequality, Income, and Growth: Are Good Times Good for Women? The World Bank development Research Group/ Poverty Reduction and Economic Management Network, Policy Research Report on Gender and Development Working Paper Series. 1.
- [29] James A. [2011] Piazza Poverty, minority economic discrimination and domestic terrorism. *Journal of Peace Research*. 48(3): 339-353.
- [30] Montalvoa JG, Reynal-Querol M. [2005] Ethnic diversity and economic development. *Journal of Development Economics*. 76: 293-323.
- [31] Michigan State University Board of Trustees. [2009] Interpreting the Index of Discrimination, U.S. Equal Employment Opportunity Commission, <http://www.eeoc.gov/graphics/seal.png>
- [32] <http://www.adviceguide.org.uk/england.htm> The Anti-Discrimination Board of NSW. [http://www.lawlink.nsw.gov.au/lawlink/Corporate/IL_corporate.nsf/vwFiles/IL_banner_slogan.jpg/\\$file/IL_banner_slogan.jpg](http://www.lawlink.nsw.gov.au/lawlink/Corporate/IL_corporate.nsf/vwFiles/IL_banner_slogan.jpg/$file/IL_banner_slogan.jpg)

ARTICLE

PERFORMANCE EVALUATION OF DIGITAL SIGNATURE USING RNS MONTGOMERY MULTIPLICATION

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ABSTRACT

Digital signature is one the most important application of cryptography algorithm. Selecting a digital signature algorithm with proper speed and security is crucial. Digital signature standard is based on elliptic curve cryptography (ECC) which provides a security equivalent to other methods such as digital sign based on RSA with much shorter key length. Since this method is composed of point multiplications, improving the multiplication operation may have an influence on the efficiency of whole system and increase the operation speed. In order to reach these goals, Montgomery multiplication algorithm along with residue number system (RNS) are employed. The results show the improvement in the implementation of considered digital signature algorithm.

INTRODUCTION

Today, by moving from traditional to digital era, protecting the information draws the attention of people as a fundamental and important element in exchanging the messages, commercial exchanges, and consequently, issues related to information security including ensuring the absence of eavesdropping the transferred information through public channels by a third unauthorized person, confirming the identity of sender, and ensuring no information change by unauthorized persons during sending process. Because of extensive changes in life and activities of individuals, organizations and governments which are resulted from the growth and development of computer network applications especially the Internet and digital computers, information security plays a vital important role in today's world. With regard to the characteristics of network communications which expose the organization information to foreign hosts, organizations need a system which prevents the accessibility of unauthorized individuals to critical and vital information. In order to maintain the correctness and accuracy of information, some methods like digital signature is used [1]. In this paper, in order to achieve high speed implementation of digital signature based on ECC, RNS Montgomery multiplication [1] is employed.

The paper is organized as follows; in the second section, the related background includes elliptic curve digital signature algorithm (ECDSA), Montgomery multiplication and RNS will be discussed. In the third section, implementation of ECDSA using RNS Montgomery multiplication will be detailed. Performance comparison will be discussed in section four, and finally section five concludes the paper.

Related Background

Digital Signature

One of the most important responsibilities of digital signature is to confirm the identity of the person signing a document and consequently the originality of received information by using a series of rules and algorithms of cryptography. Digital signature was proposed in 1985 for the first time, and then in 1991 the algorithm of digital signatures was presented, and finally in 1994 it was registered in NIST (National Institute of Standard and Technology) [2] as a digital signature standard (DSS) [3-4]. Elliptic curve digital signature algorithm is a kind of DSA which is established on the basis of elliptic curve cryptography (ECC) [5,6]. According to Table A1, ECC can provide equivalent security with shorter key length compared with the competing methods of cryptography with public key such as RSA [7-10]. Therefore, it is considered as an appropriate method in applications having a limited memory [11].

MATERIALS AND METHODS

ECDSA algorithm is presented in [Fig. 1]. According to the [Fig. 1], ECDSA requires four stages of point multiplications. On the other hand, point multiplication operation is conducted based on a collection of point doubling and point addition.

KEY WORDS

Residue number system, RSAMontgomery, digital signature algorithm, elliptic curve, standard digital signature

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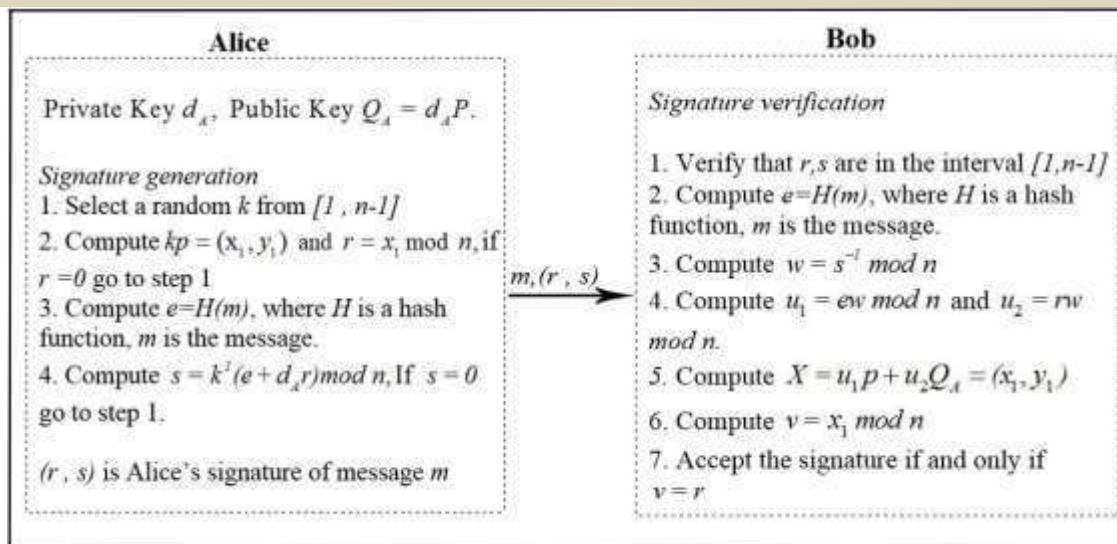


Fig. 1: ECDSA algorithm

Residue Number System

RNS is a non-weighted number system which performs the arithmetic operations like multiplication, subtraction and addition without propagating the partial carry [12]. Since conducting the calculations on the remainders is much faster than using weighted numbers due to the smaller numbers in the arithmetic operations, the speed of conducting the arithmetic operations in this system is much higher and would also decrease the consumed power [7]. In fact, the high speed of calculation due to the un-propagated partial carry, shorter data directions, reducing the operation in parallel channels, are the reasons of high popularity and usage of RNS in calculation systems [12].

RNS Montgomery Multiplication

One of the most effective methods to increase the speed of modular multiplication is Montgomery algorithm [13, 14, 15, 16]. In this method, the multiplication operation of two numbers in a special modular is conducted without executing the time consuming operation of division. Investigations conducted on this field presented a new method of Montgomery multiplication algorithm on the basis of residue number system in [17-19].

Algorithm 1: RNS Montgomery Multiplication[20]

$$r \equiv x \times y \times M^{-1} \pmod{N}$$

$$1: D = X \times Y \quad (d_i = |x_i \times y_i|_{p_i} \text{ in base } B_n \text{ and } d'_i = |x'_i \times y'_i|_{p'_i} \text{ in base } B'_n)$$

$$2: q_i = \left\lfloor d_i \times \left| -N \right|^{-1}_{p_i} \right\rfloor_{p_i} \quad B_n \text{ base extension}$$

$$3: q_i \text{ in } B_n \longrightarrow q'_i \text{ in } B'_n$$

$$4: r' = (d'_i + q'_i \times N'_i) M^{-1} \quad B'_n \text{ base extension}$$

$$5: r \text{ in } B_n \longleftarrow r' \text{ in } B'_n$$

Algorithm 1 shows the stages of Montgomery multiplication in RNS. In this algorithm, x_i and y_i are the residue representation of numbers in RNS base B , and x'_i and y'_i are the residue representation in the B' auxiliary modular set.

ECDSA implementation

In this section, ECDSA are implemented by using RNS Montgomery Multiplication and the execution time of the point multiplication is estimated for a 256 bit key size.

[Table 1] shows the recommended value of ECDSA parameters in $GF(P)$. Moreover, according to [Table 1], two values of 256 bit for X and Y and P modular for a 256 bit modular multiplication and also two values of 64 bit for $B1$ and $B2$ for 64 bit multiplication and adding are introduced.

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System specifications for the ECDSA implementation are 32 bit operating system, core i5 CPU with 4 GB RAM and also implemented with Java language in Eclipse environment. [Table 2] shows the final delay in point addition, point doubling and point multiplication. [Table 2] shows the implementation results. It can be seen that by using RNS Montgomery multiplication, noticeable improvement in speed is achieved.

Table 2: Estimating the Operation Time (μs)

RESULTS

[Fig. 2] shows the performance comparison of multiplication operation using RNS Montgomery algorithm considerably improve the operation time of point multiplication compared with a regular modular multiplication.



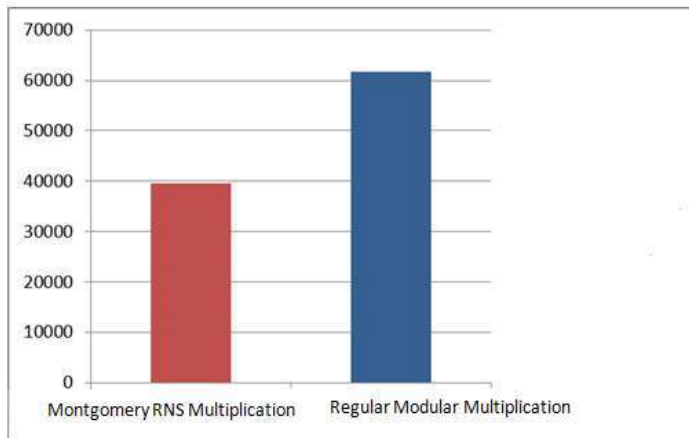


Fig. 3: Point Multiplication delay μ s)

[Fig. 3] shows the point multiplication implementation with/without using RSA Montgomery multiplication. The result shows the noticeable improvement in speed compared to original point multiplication. As discussed in section 2, four point multiplications are required in ECDSA [5-6] implementation. Therefore based on the results in [Fig. 3], it can be concluded that higher speed of ECDSA is achieved compared to original ECDSA [5-6].

CONCLUSION

In this paper, Point multiplication as the main operation in ECDSA is implemented by using RSA Montgomery multiplication. In order to implement point multiplication, point addition and doubling are implemented with Java language on eclipse environment. The result shows that noticeable improvement is achieved by employing RNS Montgomery multiplication compared to original implementation.

CONFLICT OF INTEREST

There is no conflict of interest

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REFERENCES

- [1] Diffie W, Hellman ME.[1976] New directions in cryptography. IEEE Trans.Information Theory, IT-22(6):644-654.
- [2] 10NSA .The case for elliptic curve cryptography. http://www.nsa.gov/business/programs/elliptic_curve.shtml. [2009].
- [3] 85NBS-SHS. Secure Hash Standard (SHS). FIPS Publication 180-2, NationalBureau of Standards, [2003] <http://csrc.nist.gov/publications/fips/fips180-2/fips180-2.pdf>.
- [4] U.S. Department of Commerce / National Institute of Standards and Technolgo, Digital Signature Standard (DSS), <http://csrc.nist.gov/publications/fips/fips186-2/fips186-2-change1.pdf>.
- [5] Koblitz N.[1987]Elliptic Curve Cryptosystem, Mathematics of Computation.48:203-209.
- [6] Miller V. [1985] Uses of Elliptic Curves in Cryptography, Advances in Cryptology- CRYPTO, Williams HC(ed.). 218 :417-426.
- [7] Posch KC, Posch R. [1992] Residue Number System: a Key to Parallelism in Public Key Cryptography, IEEE Symposium on parallel distributed processing. 432-435.
- [8] Bajard JC, Imbert L. [2004] A Full RNS Implementation of RSA, IEEE Transactions on Computers. 53(6): 769-774.
- [9] Skavantzios A, Abdallah M. [1999] Implementation Issues of the Two-level Residue Number System with Pairs of Conjugate Moduli, IEEE Trans. on Signal Processing. 47(3):826- 838.
- [10] Rivest RL, Shamir A, Adleman LM. [1978] A Method for Obtaining Digital Signatures and Public-Key Cryptosystems, Commun. ACM. 21 (2):120-126.
- [11] Arjen K, Lenstra, Eric R. [1999] Verheul. Selecting cryptographic key sizes. *Journal of Cryptology*. 14:255-293.
- [12] Navi K, Molahosseini ASM.[2011] Esmaeildoust, How to teach residue number system to computer scientists and engineers? *IEEETrans. Edu*.54 (1):156-163.
- [13] HanserCh.[2010] New Trends in Elliptic Curve Cryptography, Master Thesis,Graz University of Technology.
- [14] Montgomery PL. [1985] Modular Multiplication without Trial Division. *Math. Computation*. 44:519-521.
- [15] Hamano T, Takagi N, Yajima S, Preparata FP. [1995] O(n)-Depth Circuit Algorithm for Modular Exponentiation, Proc. 12th IEEE Symp. Computer Arithmetic, Knowles S and McAllister WH, eds.188-192.
- [16] Koc CK, Acar T. [1997] Fast Software Exponentiation in GF (2k), Proc. 13th IEEE Symp. Computer Arithmetic, Lang TJ, Muller M, Takagi N, eds.225-231.
- [17] Bajard J, Didier L ,Kornerup P. [1998] An RNS Montgomery's Modular Multiplication Algorithm, IEEE Trans. Computers. 47(2):167-178.
- [18] Bajard J, Didier L, Kornerup P. [2001] Modular Multiplication and Base Extensions in Residue Number Systems, Proc. 15th IEEE Symp. Computer Arithmetic (ARITH '01).59-65.
- [19] Wang W, Swamy MNS, Ahmad MO, Wang Y.[2000] A high-speed residue-to-binary converter and a scheme of its

- VLSI implementation, IEEE Transactions on Circuits and Systems-II. 47(12):1576–1581.
- [20] Nozaki H, Motoyama M, Shimbo A, Kawamura S. [2001] Implementation of RSA Algorithm Based on RNS Montgomery Multiplication, Proc. Cryptographic Hardware and Embedded Systems (CHES 2001). 364-376.

ARTICLE

INTEGRATING EARNED VALUE MANAGEMENT WITH RISK MANAGEMENT TO CONTROL THE TIME-COST OF THE PROJECT

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ABSTRACT

According to PMBOK standard, eighth process of project management is risk management. Technique of Earned Value Management (EVM) as well as project planning and control system in recent decades has been widely used. Integration of risk management and earned value management to predict and estimate the cost and time of completion of the project is an effective tool in the management and control of the project. Each of these techniques has at least one key weakness; the main weakness of EVM is focus of this way on predicting future development based on past progresses. The event that has happened in the past is not concerned by risk management; now according to this importance, in this paper outlines two methods and explains benefits of integrating earned value management with risk management in order to achieve maximum performance.

INTRODUCTION

One of the most effective performance measurement and feedback tools for managing a project is earned value management (EVM). It provides a means to forecast future performance of the project based upon its past performance by utilizing a fundamental principle that patterns and trends in the past can be good predictors of the future. EVM allows the calculation of cost and schedule variances and the forecast of a project's cost and schedule duration [1]. Although EVM was set-up to follow time and cost, the majority of the research have focused on the cost aspect alone. Nevertheless, EVM provides two well-known schedule performance indices: the schedule variance and the schedule performance. These two measures are useful indicators to analyze a project's performance; however, they have some problems. For example, they are based on monetary unit and not on time. They can behave in ways that are not normally expected of schedule indicators and predictors. Furthermore, it is also possible that an earned value analysis may show that the project is delayed; on the contrary, the project would be on time. In this study, we consider these aforementioned problems and propose two new methods to resolve them.

EVM was introduced by agencies of the U.S. federal government as a part of the control system criteria. Nowadays, it is believed that EVM has many advantages and would control the performance of a project, but there are a few studies on EVM. Lipke [2] developed cost and schedule ratios to manage cost and schedule reserves in projects. Lipke [3] also introduced the earned schedule. Henderson [4,5] studied the applicability and reliability of the earned schedule. Anbari [1] enhanced the effectiveness of earned value implementation. Kim et al. [6] studied the implementation of earned value in different types of organizations and projects. Lipke [7] developed project cost and time performance probabilities. In addition, Vandevor and Vanhoucke [8] concluded that the best and the most reliable method to estimate time at completion is the earned schedule method. A new notation for the earned value analysis is presented in Cioffi [9] to make EVM mathematics more transparent and flexible. Lipke et al. [10] provided a reliable forecasting method of the final cost and duration to improve the capability of project managers for making informed decisions. Moslemi-Naeni et al. [11] presented a new fuzzy-based earned value model with the advantage of developing and analyzing the earned value indices and the time and the cost estimates at completion under uncertainty. Pajares and López-Paredes [12] introduced two new metrics for integrating EVM and project risk management methodologies: cost control and schedule control indices. These two indices compare EVM measures with the maximum value that a project should exhibit if the project was running under the risk analysis hypothesis. Moslemi-Naeni and Salehipour [13] developed new indices under fuzzy circumstances and evaluated them using alpha cut method. Acebes et al. [14] proposed a graphical framework for EVM to integrate the dimensions of project cost and schedule with risk management. Hunter et al. [15] focused on the implementation of EVM on the Radiation Belt Storm Probes project to improve cost monitoring and control. Czemplik [16] applied EVM to progress control of construction projects. Recently, some more studies have been published regarding other aspects of EVM [17,18,19].

EVM and risk management (RM) encourage the use of management techniques based on the results. Since earned value management and risk management both have been considered to solve similar

KEY WORDS

Earned Value Management (EVM);
Risk Management (RM);
Project Management

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problems as well as gives us information about the decisions and performance many measures have been done for synergy of integration results of these two techniques in order to achieve maximum possible efficiency of project management [20].

MATERIALS AND METHODS

According to PMBOK standard, eighth process of project management is risk management. Technique of Earned Value Management (EVM) as well as project planning and control system in recent decades has been widely used. Integration of risk management and earned value management to predict and estimate the cost and time of completion of the project is an effective tool in the management and control of the project. Each of these techniques has at least one key weakness; the main weakness of EVM is focus of this way on predicting future development based on past progresses. The event that has happened in the past is not concerned by risk management; now according to this importance, in this paper outlines two methods and explains benefits of integrating earned value management with risk management in order to achieve maximum performance.

Risk management

From the organization of project management, risk management is introduced as one of the nine original level of "Project Management Body of Knowledge" (PMBOK); definition of this organization of project risk management is: "All processes associated with identifying, analyzing and responding to any uncertainty which contains maximizing desired events results and minimizing the adverse events results". PMBOK standard has described risk management processes in six stages [21]:

- 1- Risk Management Planning
- 2- Risk Identification
- 3- Qualitative Risk Analysis
- 4- Quantitative Risk Analysis
- 5- Risk Response Planning
- 6- Risk Monitoring and Control

EVM: Earned value management

EVM integrates a project's scope, schedule, and cost into a unified set of prescribed metrics to monitor and forecast the project's performance. Building blocks of all EVM metrics are the following three elements [22]:

- Earned value (EV) or budgeted cost of work performed (BCWP): it is the budgeted amount for the work actually completed on the schedule activity or work breakdown structure (WBS) component during a given time period.
- Planned value (PV) or budgeted cost of work scheduled (BCWS): it is the budgeted cost for the work scheduled to be completed on an activity or WBS component up to a given point in time.
- Actual cost (AC) or actual cost of work performed (ACWP): it is the total cost incurred in accomplishing work on the schedule activity or WBS component during a given time period. It is also called spent cost.
- BAC: Budgeted At Completion: total budget allocated to a project.
- SV: Scheduled Variance: This quantity measures the deviation between the supposed progress in the program with the actual progress.
- CV: Cost Variance: This quantity compares the deviation between the actual cost of the work done with the projected cost for them.
- Timing behavior index (Genuine Progress Index): This indicator shows how desirable or undesirable are real progress of things.
- CPI: Cost Performance Index: This indicator shows how much the real cost process is favorable or unfavorable.

These data points can be used to analyze the current status of a project and forecast its likely future. EVM analysis has two parts: cost analysis and schedule analysis. In schedule analysis, EVM uses both schedule variance ($SV = EV - PV$) and schedule performance index ($SPI = EV/PV$). Also, cost variance ($CV = AC - PV$) and cost performance index ($SPI = AC/PV$) are used in cost analysis of the EVM.

Whenever $CV < 0$ and $CPI < 1$, the project is over budgeted (otherwise, if $CV > 0$ and $CPI > 1$ the project is under budgeted). Furthermore, if $SV < 0$ and $SPI < 1$, the project is delayed (otherwise, if $SV > 0$ and $SPI > 1$ the project is ahead of schedule). When $CV = 0$ ($CPI = 1$) and/or $SV = 0$ ($SPI = 1$) the project is respectively on cost and/or timely.

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By means of monitoring the evolution of these indices over the project's life cycle, managers can detect deviations from plan so that they can take early corrective actions.

RESULTS

Weaknesses of each technique

Each of these techniques has at least one key weakness; the main weakness of EVM is focus of this way on predicting future development based on past progresses [20]. Cleland and "A Ireland" in his book "Management - Project: Design and implementation of the strategy", writes: It's like someone driving at a speed of 160 kilometers per hour, but his eyes are constantly on rearview mirror". EVM power is at great care that does in evaluation of past of project using quantitative measurement criteria. EVM is to predict the project future based on its past. You cannot just drive a car by looking at the rear-view mirror, you should look forward and this is what risk management does. While planning of the project looks a step further, risk management looks the more distant horizon EVM acts such as radar that examines the uncertain future. But the risk management identifies the risks should be avoided and also future benefits. The event that has happened in the past is not concerned by risk management because there is no ambiguity about them. If EVM predicts the future only with respect to the past, but risk management looks only to the future, so if you merge these two aspects you can create a positive synergy. By combining sight of the car side mirror and radar that looks forward weaknesses of each can be covered. As a result, by the use of forward-looking of risk management we can achieve advantages in Earned Value Management [20].

The synergy derived from the integration of the two techniques

According to common goals of EVM and risk management, the assessment of the implementation problems of the project, and also by knowing their differences it seems that there are several areas of synergy between the two techniques. These limits are discussed in the following sections.

Creating measurement of function (BCWS / PV / PMB)

To evaluate aspects of a project in terms of time and expense a measurement base is required that is specified from the beginning of the project and the project situation can be evaluated and compared to that case. The basis that is used in the EVM is the program value (PV) that is called Planned Baseline or Budgeted Cost of Work Scheduled (BCWS) or Performance Measurement Baseline (PMB). The first thing a project manager learns is that the reality does not match exactly with project planning. One of the features of integration of risk management and EVM is attention to the risk and uncertainty in the PV. Before the project began with a thorough assessment of the risk of the project plan the uncertainty of the time and cost can be predicted and the degree of risk can be assessed at baseline of project plan.

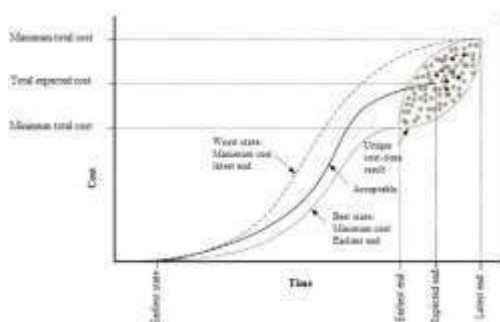


Fig. 1: Diagram of accumulation of risk-based cost

For this purpose, quantitative techniques of risk analysis such as "Monte Carlo" are very useful that specifies the assessed likelihood of events and results of the time or cost of project risks. In each risk, scheduled reaction to risk should be considered and should be brought in the expected cost of the project as well. In the risk analysis three modes of optimistic, pessimistic and likely are intended for project implementation and as three S-shaped diagrams are shown. The three states are shown in [Fig. 1]. The area at the right and the highest point is obtained shows the worst case (highest cost, longest timing schedule). The best case is at the lowest point and at left direction. (Cheapest and fastest) And the center of the curve indicates the desired outcome. These curves are called "Eyeball Plot or in USA are called" football diagram ". One of suggestions of combination approach of EVM and risk management is that the diagram in which time-cost risk is considered be used as PV. In other words, the central S-shaped curve in [Fig. 1] be used instead of the original curve as a baseline. So we can be sure that EVM baseline has fully

considered risks related to the project plan. It is clear that risk analysis should be made with the same units by which EVM have been done.

Forecasting future results (EAC)

EVM and risk management wants to predict the future based on available information of the project. Earned Value Management predicts the future using the formulas used in the "Estimate at Completion (EAC)". Most of times these formulas are started with actual costs (BCWP / AC) and remaining funds will be added to it. Risk management predicts the future for the project by analyzing the effects of known risks and remaining uncertainties for the project. In the case of using the integrated model of cost - time, the result of the S-shaped diagrams would be like [Fig.1], but with this difference that it also covers incomplete part of the project.

As at risk and EVM we should determine the baseline of primacy cost, other factors of project should also be estimated. You can also use the results of the risk analysis in order to show the effect of specific risks (opportunities or threats) on the project and compare it with what has been obtained from earned value. Since risk analysis includes estimations of "uncertainty" and "specific risks", this model can be used to perform the analysis of states with low uncertainty and also indicate the effects of a specific risk. For example, if a key risk was modeled using this potential method, an analysis of "if it happened - what to do" can reach risk probability to zero. The result of this action is a sequence of the accumulation diagrams of probable distribution of accumulation (S curve). This allows identifying important risks that must be identified on a priority basis. If the same technique is used to make PV, risk analysis shows which of the risks has the maximum impact on earned value and implementation of the project.

Risk model shows the effects of different risks and the planned reactions of the project rest. EVM approach occurs in cases where specific changes as a result of change of the range or the risk event and take into consideration probabilities at baseline. The results of the quantitative risk analysis show that, in order to cover a level of the remaining risks of project how much probability should be considered in the baseline.

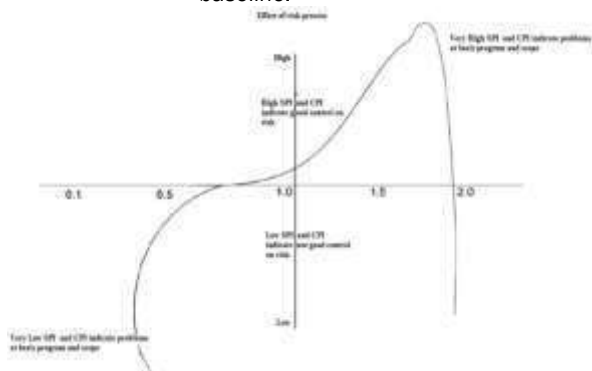


Fig. 2: The relationship between indicators of EVM with risk management

Evaluation of the effectiveness of risk process

Since Earned Value Management index (CPI, SPI) shows advanced deviations from the program, these indices can show the effectiveness of risk process in the assessment of uncertainty and control of its effects. [Fig.2] shows (CPI, SPI) and the efficient risk management process.

- If CPI or SPI is less than 1, project progress is further back to program, and one of its reasons is risk process failure in keeping project on the primary base. And when these risks are turned into problems, there will be delay or additional cost in project. In this case, the manager should consider risk management and evaluate its efficiency.
- If CPI or SPI is higher than 1, the development project has been more than the program and the risk process must focus on the use of available opportunities, it examines the best risk management process and the opportunity together and seeks to minimize risk and maximize opportunity. When the Earned Value Management represents opportunities in the project, the risk process identify these opportunities and tries to earn additional profits from the project.
- It should be noted, being too high CPI or SPI (much greater than 1) does not represent an opportunity for project but also show there are other problems in the project. Usually, if real progress is so much more expected program, it can be concluded that in determining the initial baseline, a poor planning has been done or areas have been marked by mistake.

- Similarly, if the CPI or SPI is so much less than 1, it is not only the result of not managed risks, it can also be the result of problems in the program or scope baseline.

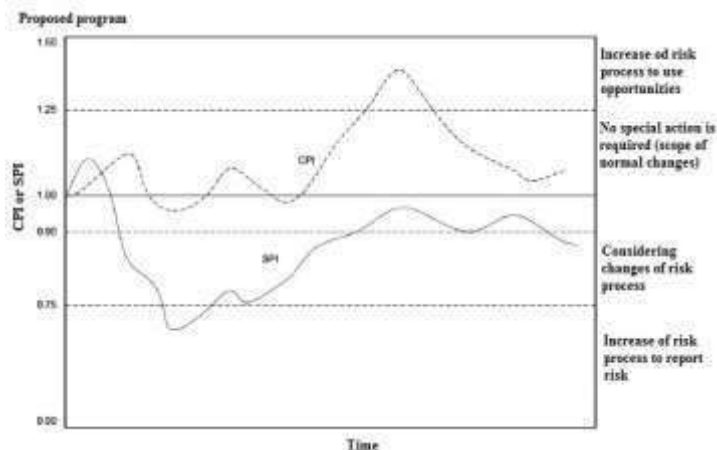


Fig. 3: EVM indicators process as a sign of the effectiveness of risk management process

Important point in the use of EVM indicators is to determine the effectiveness of risk management in that we should identify appropriate threshold where the focus is on risk process. Clearly, with the progress of the project, changes in the EVM are made, and lack of risk process adjustment is considered as a result of these wrong changes. In any case, if a process starts and passes the threshold of "normal deviations", actions should be considered; [Fig. 3] shows this. Threshold of "normal deviation" for CPI and SPI has been considered greater and equal to 0.9 and smaller than 1.25. A threshold has been specified as "alert threshold" that indicates a problem is underway and initial steps should be taken. Thresholds of 0.75, and 1.25 and 0.9 have been only marked for use in [Fig.3] and in the case of further research better thresholds can be determined.

Drawing CPI and SPI against these thresholds gives us useful information about the risks that we face at every point of the project. The recommended measures in the form of (4) have been drawn that are as a result of the following four situations:

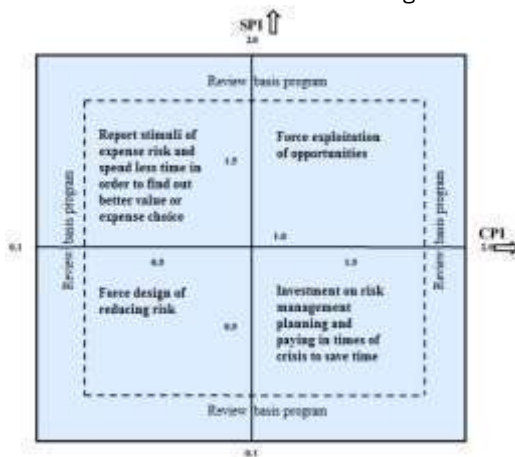


Fig. 4: Risk management decisions and EVM indicators

1. High CPI and SPI (highest right corner), creation of opportunity.
2. Low CPI and SPI (lowest left corner), an active effort should be made to evaluate the hazards.
3. High SPI and low CPI (highest left quadrant) shows a need to pay attention to the risk of costs, and likelihood to spend more time to evaluate it.
4. High CPI but low SPI (lowest right quadrant) shows we must pay more attention to the risk of schedule program and costs of the work end should be considered [23].

CONCLUSION

EVM and risk management seek to improve decision-making using rational framework based on project progress. EVM examines past progresses against the defined quantitative scales and uses them to predict

future of project. Risk management to identify and assess the uncertainties with the ability to influence the progress of the project (positive or negative) considers future and creates reactions necessary against risks. Both methods are common in focusing on the development of projects and have a common goal in creating effective measures to correct the unpleasant processes, and in order to maximize the probability of achieving the project goal.

EVM does this with the review of past as an indicator of future progress, and risk management looks to the future and possible results of project. The two approaches are not inconsistent with each other. In fact, their common points create a powerful synergy that it can be achieved by combining their strengths and the use of view of one to use one else.

CONFLICT OF INTEREST

There is no conflict of interest

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REFERENCES

- [1] Anbari F. [2003] Earned value project management method and extensions. *Project Management Journal*, 34(4): 12-23.
- [2] Lipke W. [1999] Applying management reserve to software project management. *Defense Software Engineering*. 17–21.
- [3] Lipke W. [2003] Schedule is different. *The Measurable News*. 31-34.
- [4] Henderson K. [2003] Earned schedule: a breakthrough extension to earned value theory? a retrospective analysis of real project data. *The Measurable News*, Summer.13 –23.
- [5] Henderson K. [2004] Further developments in earned schedule. *The measurable news*, Spring. 15–22.
- [6] Kim E, Wells WG, Duffey MR. [2003] A model for effective implementation of Earned Value Management methodology. *International Journal of Project Management*. 21(5): 375– 382.
- [7] Lipke W. [2004] The probability of success. *The Journal of Quality Assurance Institute*. 14–21.
- [8] Vandevoorde S, Vanhoucke M. [2005] A comparison of different project duration forecasting methods using earned value metrics. *International Journal of Project Management*. 24(4): 289–302.
- [9] Cioffi DF. [2006] Designing project management: a scientific notation and an improved formalism for earned value calculations. *International Journal of Project Management*. 24(2): 136 –144.
- [10] Lipke W, Zwikael O, Henderson K, Anbari F. [2009] Prediction of project outcome. The application of statistical methods to earned value management and earned schedule performance indexes. *International Journal of Project Management*. 27(4): 400–407.
- [11] Moslemi-Naeni L, Salehipour A. [2011] Evaluating fuzzy earned value indices and estimates by applying alpha cuts. *Expert Systems with Applications*. 38(7):8193–8198.
- [12] Pajares J, López-Paredes A. [2011] An extension of the EVM analysis for project monitoring: The Cost Control Index and The Schedule Control Index. *International Journal of Project Management*. 29: 615–621.
- [13] Moslemi-Naeni L., Shadrokh S, Salehipour A. [2011] A fuzzy approach for the earned value management. *International Journal of Project Management*, 29, 764–772.
- [14] Acebes F, Pajares J, Galán JP, López-Paredes A. [2013] Beyond Earned Value Management: A Graphical Framework for Integrated Cost, Schedule and Risk Monitoring. *Procedia - Social and Behavioral Sciences*, 74: 181-189.
- [15] Hunter H, Fitzgerald R, Barlow D. [2014] Improved cost monitoring and control through the Earned Value Management System. *Acta Astronautica*, 93: 497-600
- [16] Czemplik A. [2014] Application of Earned Value Method to Progress Control of Construction Projects. *Procedia Engineering*, 91: 424-428
- [17] Acebes F, Pereda M, Poza D, Pajares J, Galán J. [2015] Stochastic earned value analysis using Monte Carlo simulation and statistical learning techniques. *International Journal of Project Management*. 33:1597–1609.
- [18] Colin J, Martens A, Vanhoucke M, Wauters, M. [2015] A multivariate approach for top-down project control using earned value management. *Decision Support Systems*. 79: 65-76.
- [19] Kim J, Koo C, Kim C, Hong T, Park H. [2015] Integrated CO2, cost, and schedule management system for building construction projects using the earned value management theory. *Journal of Cleaner Production*, 103, 275–285.
- [20] Hilson D. [2004] Earned Value Management and Risk Management: A Practical Synergy. *Global Congress Proceeding*, PMI, Anaheim, California, USA.
- [21] North DW. [1995] Limitations, definitions, principles and methods of risk analysis, *OIE Rev. sci. tech. Off. Int. Epiz*, 14(4).
- [22] Kerzner HR. [2013] *Project Management: A Systems Approach to Planning, Scheduling, and Controlling*. 11th ed. John Wiley & Sons.
- [23] Infani G, Abba W, Coleman R. [2002] Integrating Risk Management With Earned Value Management, *National Defense Industrial Association-Program Management System Committee (NDIA-PMSC)*, USA.

ARTICLE

FOREIGN DIRECT INVESTMENT AND REGIONAL ECONOMICS

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ABSTRACT

This paper examines the impact of the emergence of regional blocs (customs unions) on the patterns of inter-bloc and intra-bloc trade when firms have the option to engage in direct investment (FDI). The consequences of bloc formation for exogenously given external tariffs is examined first. When two regional blocs co-exist and firms have the option to engage in FDI, all inter-bloc trade may cease- complete trade diversion that is replaced by inter-bloc FDI - investment creation. In such an event the volume of world trade declines but this is more than offset by the increase in world output due to direct investment. Hence, total world output is the same as under free trade. Second, I investigate the optimal tariff that a trading bloc levies on imports from nonmember countries. The equilibrium tariffs resulting from a non cooperative game played by the trading blocs is restricted by the option to circumvent the tariff via two-way direct investment. Small setup cost associated with FDI leads to low tariffs and the outcome is almost free trade. MNEs are likely to continue to undertake FDI within the regional blocks in order to continue to benefit from regional comparative advantage and also to overcome the external tariffs that are imposed on imports into the trading block. Finally, the formation of two regional blocs enhances the welfare of all countries.

INTRODUCTION

KEY WORDS

Foreign direct investment,
multinational enterprise
(MNE), Regional Trading
Bloc (RTB).

Foreign direct investment (FDI), perhaps more than all other international economic activities, has the potential to link economies, thereby integrating world markets. Baker et al. [1] indicate, for instance, that FDI allows firms to engage in international cost of capital ('cheap capital') arbitrage, and it can also enable firms to engage directly in labor cost differential arbitrage, thus furthering the integration, respectively, of worldwide capital and labor markets. In addition, FDI enables firms to conduct goods arbitrage in situations where exporting or licensing might not be possible, and it also brings about direct contact between home and host-country individuals, thus helping to integrate worldwide product markets as well as fostering the spread of international technology and best practice. This paper therefore theorizes that FDI between countries fosters stock market integration, with empirical tests supporting the paper's hypotheses that both the flow and the level of bilateral FDI between countries can explain country-pair stock market integration.

Most foreign direct investment (FDI) flows from a few developed economies into other developed economies. Flows to developing economies have recently increased but are still smaller and the world stock of FDI is very unevenly spread. The emergence of regional trading blocks and new areas for FDI has somewhat changed these flows.

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Foreign direct investment (FDI) is of interest to students of the regional economy. FDI began to emerge on a significant scale in the immediate post-war period, but it was not until the 1960s that it began to spread-out from the South East of England and locate in other U K regions. This was no doubt prompted partly by the availability of loans and grants for regional development from that time. Most of this investment was from the United States, and it was given fresh impetus and created new interest in the 1980s and 1990s: first by the arrival of investment from the Far East: but then from western Europe in the run-up and completion of the Single European Market; and finally by the mergers and acquisitions 'boom' of the late 1990s. This period is unparalleled in the history of international capital flows. In 1970 the world FDI stood flows at \$13 billion, but by the year 2000 they are believed to have been \$1,500 billion. Virtually all the FDI has involved flows out of the developed world, and to a substantial degree it has also flowed into these areas, of which the United Kingdom (UK) is a major beneficiary over the 1990s. While FDI has fallen-back recently, there can be no doubt about the central role that FDI plays in the phenomenon of 'globalization', and the central importance of multinational enterprises to modern economic activity.

In today's global economy, foreign direct investment (FDI) has superseded trade with global sales by multinational enterprise (MNE) affiliates worth \$5.2 trillion in 1992 compared with world-wide exports of goods and services of \$5.0 trillion in 1992 [2]. In 1993 global trade had increased from \$3.7 trillion to \$4.2 trillion in 1994, and by 1995 had accelerated to \$5.0 trillion [2]. Moreover an estimated one-third of world trade is intra-firm trade within MNEs. In 1995, FDI outflows increased by 38 percent over 1994 values, and this was a substantially greater increase than that of exports of goods and services, which increased by 18 percent in 1994, whilst world output increased by 5.4 percent and gross domestic capital formation (GDFCF) by 5.3 percent over 1994 [2]. Thus in 1995, FDI outflows again exceeded the increases in trade and world output. In consequence, the role and importance of MNEs in the global business environment has continued to increase.

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With such growth continuing, it is therefore interesting to see which countries are sources of FDI outflows and which are recipients, and to see how the three main trading blocks in the world economy have so far influenced these flows, and also to speculate on future changes.

Outflows of foreign direct investment

Foreign direct investment (FDI) outflows from the United States reached \$252 billion in 2004 – up from \$141 billion in 2003 to hit an all-time record. While this to some extent reflected the weakness of the dollar, it also confirmed continuing strong interest among US companies in acquiring corporate assets abroad.

Of the largest 25 cross-border mergers and acquisitions in 2004, five had a US-based company as the acquirer. A recovery of M&A activity in 2004, meanwhile, has carried on into 2005. On present trends, both inward and outward FDI in OECD countries could increase by 10-15 per cent in 2005, OECD estimates suggest.

Inward FDI into Germany and France, the two largest economies of the European continent, fell sharply in 2004. In France inward investment almost halved, falling from \$43 billion to \$24 billion. In the case of Germany, foreign investors actually withdrew about \$39 billion from the country, reversing the inflow of \$27 billion recorded in 2003. (Inward FDI figures include transactions, which can involve both inflows and withdrawals, between foreign-invested enterprises and their foreign mother companies. The downturn in 2004 largely reflected repayments to recipients outside Europe of inter-company loans and other transaction between related enterprises.)

For the OECD area as a whole, according to figures newly published by the OECD in an article on “Trends and recent developments in Foreign Direct Investment”, FDI inflows continued on a downward trend, falling to \$407 billion in 2004 from \$459 billion in 2003. Outflows, on the other hand, rose from \$593 billion in 2003 to \$668 billion in 2004.

Against this background, net FDI outflows from OECD countries to the rest of the world reached record high levels in 2004: the OECD area was a net contributor of \$261 billion worth of direct investment – most of which went to developing countries. In 2003, OECD countries invested a net \$134 billion outside the OECD area.

Over the past decade, there has been an underlying upward trend in FDI outflows, although they have been affected by cyclical downturns in the international economy. FDI outflows in 1990 and 1991 declined but recovered in 1993 and 1994, and by 1995 FDI outflows had reached record heights of \$318 billion, which was an increase of 38 percent over 1994.

Of total outflows of FDI over the period 1982-91, 94 percent came from developed countries. This percentage was to decline marginally over the 1990s, falling to 85.3 percent by 1993, and 83.0 percent in 1994; however in 1995 it recovered to 85.1 percent [3].

Over the period 1982-91, the developing economies were responsible for only just over 6 percent of total FDI outflows (a total of \$16 billion compared with \$188 billion from developed economies). However this absolute amount increased, as did their share, so that by 1992 they were responsible for 10.6 percent, increasing to 14.6 percent in 1993, and to 16.8 percent in 1994, although this was to decline to 14.8 percent in 1995. But the amount of FDI outflows by developing countries in 1995, at \$47 billion, was also their highest ever. This indicates that developing countries are accelerating their integration into the world economy [3], although the proviso needs to be made that these outflows come from a limited number of countries, as does FDI from developed economies.

With the globalization of the international economy has come a greater interdependence between countries. This is clearly illustrated by the fact that five OECD countries –France, Germany, Japan, the U.K. and the U.S.A.– had, during the 1980s (and before), been responsible for nearly 70 percent of all FDI outflows that came from developed countries [Table 3], while in 1995 it was to exceed this former total. The importance of these FDI outflows on the economy and prosperity of both home and host countries is well documented by Dunning [4] and other writers.

Table 1:Total FDI Outflows 1984-95 (US\$ millions)

Total outflow	1984-89 Annual average	1990	1991	1992	1993	1994	1995
	121,630	240,253	210,821	203,115	225,544	230,014	317,849

Source: UNCTAD (3).

Table 2: FDI Inflows and Outflows of Developed and Developing Countries (percent of total)

	Developed countries		Developing countries	
	Inflows	Outflows	Inflows	Outflows
1982-86	69.4	93.0	30.6	7.0
1987-91	81.6	93.8	17.8	6.2
1992	67.8	89.3	30.0	10.6
1993	62.2	85.3	35.2	14.6
1994	58.8	83.0	38.5	16.8
1995	64.5	85.1	31.6	14.8

Note: The balance represents flows into and out of Central and Eastern European economies Source: UNCTAD (2, 3).

The U.S.A. had been the largest source of global outward investment and over the 1980s and 90s seldom lost that position. The dominance of the U.S.A. is illustrated by the fact that it has been the largest single source of FDI for four out of the last six years.

The U.K.– a country which historically had been a major source of FDI– still continues to export substantial amounts of FDI. Over the period 1982-86 the U.K.'s capital outflows amounted to \$10 billion compared with the U.S.A.'s \$11 billion, but over the 1980s and '90s, as world outflows of FDI grew rapidly, the U.K.'s volume remained relatively stable. Thus as world FDI volumes grew, the U.K.'s share fell, although in 1993, 1994 and 1995 it was to re-emerge into second position.

Table 3: FDI Outflows of Selected Countries: Shares in Total (percent)

Year	France	Germany	Japan	U.K.	U.S.A.	Total
1982-86	5.3	11.5	12.3	17.5	19.3	64.9
1978-91	10.3	9.2	17.9	14.3	12.8	64.6
1992	16.2	8.4	8.9	9.9	20.4	63.9
1993	9.5	7.7	6.3	11.7	31.1	66.2
1994	10.4	9.5	8.1	11.2	20.7	59.4
1995	5.5	11.1	6.7	11.9	30.0	65.2

Source: UNCTAD (2,3).

Recent data on FDI flows

Recent [Fig. 3] show that there has been a cyclical pattern in the volume of inward FDI flows into regions, with troughs in 1991 and 1992, and recovery coming in 1993 onwards. The EU, as already mentioned, had a greater share of these total inflows in 1990, 1991 and 1992, largely at the expense of NAFTA, and still attracts a larger proportion than either NAFTA or Asia. Flows into the newly industrializing countries of South and South East Asia remained at a relatively stable level throughout the period– at around 7 percent of total flows. China, however, dramatically increased her share in the 1990s. From an annual average figure over the period 1984-89 of 2.0 percent, which was to fall in 1990 to 1.7 percent, China was to rapidly increase her share between 1991 and 1994, so that by that latter year she was absorbing nearly 15 percent of the total world inflows of FDI– a truly remarkable achievement. Moreover aggregating the totals for the Asian Seven, Japan and China shows that in 1994 22.5 percent of total FDI inflows went into South and South East Asia– a total that virtually the inflows into the EU and NAFTA.

FDI destinations within Europe

For many years, the European Union has received roughly 90 percent of all FDI coming into Europe. In the 1980s within Europe, the U.K. has been consistently the largest recipient of FDI inflows, with shares ranging from nearly 40 to 25 percent. France has also been popular, but has attracted less than half of the amount that came into the U.K., with Spain attracting nearly as much as France. These three locations attracted, on average, 62 percent in the 1990s [Table 5]. Thus a very uneven spread of inward FDI occurred within Europe.

Table 4: Distribution of Flows of Inward FDI (percent)

	1984-89 Annual average	1990	1991	1992	1993	1994	1995
World \$ million	115,370	203,712	157,773	168,122	207,937	225,660	314,933
EU	32.7	47.8	49.2	47.5	35.8	28.4	35.5
NAFTA	44.3	28.6	18.7	15.8	24.3	28.3	24.9
Asian 7*	5.0	6.9	9.7	7.9	7.8	7.2	7.1
Japan	0.1	0.9	1.1	2.1	0.1	0.4	0.0
China	2.0	1.7	2.8	6.6	13.2	14.9	11.9
Latin America and Caribbean	6.7	4.4	9.7	10.5	9.4	11.2	8.4

*Korea, Singapore, Taiwan, Malaysia, Indonesia, Philippines, Thailand. Source: UNCTAD (3).

Table 5: National Shares of Western European FDI Inflows 1991-95 (percent)

	1990	1992	1993	1994	1995
France	19.5	27.4	27.7	26.8	18.0
Spain	16.1	16.6	10.9	14.6	7.4
U.K.	20.9	18.7	19.4	15.7	26.7
Germany	5.2	3.0	0.4	4.7	8.3
Total	61.8	65.7	58.6	61.8	60.4

Source: UNCTAD (3)

Types of regional trading blocks

There has been a dramatic increase in regional trading blocs over the last decade. In many cases, these trading blocs seem to have succeeded in attracting Foreign Direct Investment (FDI). According to a World Trade Organization study, total inflows of FDI into the member countries of the European Community (EC) increased considerably from European Currency Unit (ECU) 10 billion in 1984 to ECU 63 billion in 1989, following the announcement of the Single Market Program in 1985. The Southern Cone Common Market in Latin America, better known as MERCOSUR, observed an increase in FDI inflows from \$10 billion in 1995 to \$17 billion in 1997. However, traditionally when trade economists discuss trading blocs, they have looked mainly at the trading of goods and have not paid appropriate attention to the importance of FDI, largely out of habit.

Economic integration within members of regional trading blocks (RTBs) can take a variety of forms. Of the three RTBs that have emerged so far, the EU has developed furthest along the continuum since the creation of the Single Market. Since 1992 all trade and non-trade barriers to trade have been abolished, thus allowing the free movement of goods, people and money within this single market. The degree of intra-European trade, and economic integration, will be further assisted by monetary union that will occur if, and when, the single currency is introduced within Europe at, or soon after, 1999. Thus Europe will move further along the continuum.

Table 6: National Shares of Western European FDI Inflows 1991-95 (percent)

Home country	1980	1985	1990	1994	1995
France	4.6	5.4	6.5	7.6	7.4
Germany	8.4	8.7	8.0	8.2	8.6
Japan	3.7	6.5	12.2	11.8	11.2
U.K.	15.7	14.6	13.7	11.7	11.7
Germany	42.9	36.6	25.8	25.3	25.8
As a percentage of total	75.3	71.8	67.2	64.6	64.7

Source: UNCTAD (3)

NAFTA does allow the free movement of goods between member countries but this does not extend to people and thus is a very different extent of economic integration. However, NAFTA does allow firms to profit from different factor endowments between countries within this RTB, and so prompt a more efficient use of most but not all factors of production (not labor) within this RTB.

The Asia Pacific Economic Cooperation (APEC) block is a much looser form of economic co-operation and is more, at present, 'a consensus to achieve certain goals', although there is a binding commitment to achieve those goals. APEC has agreed to become operational for developed countries within the region by the year 2010, and by 2020 for developing countries, although much co-operation does already take place. There is an agreement to establish free trade within the region by 2020 at the latest, whilst much FDI has and will continue within the region as MNEs of members undertake FDI within the regional block.

That a country may be a member of more than one RTB is illustrated by the U.S.A. and Canada which are members of both NAFTA and APEC. Within an RTB, governments of member countries agree to harmonize their macro-economic policies in the cause of regional economic stability. Thus having these two RTBs as 'overlapping sets' will mean that, as they are responsible for such a large percentage of world trade and world FDI, such regional economic stabilization between such a large number of countries will greatly assist global economic stabilization.

FDI between regional trading blocks

RTBs between FDI between is still occurring and seems likely to remain and even increase as MNEs in North America view Europe as the most important location for expansion in the future, especially in consumer goods industries while European MNEs view the U.S.A. with similar favor [3].

The developing countries in Asia– the core of the APEC block–form the most significant developing region in terms of FDI [5].

FDI inflows into developing Asia reached \$59 billion in 1994, an increase of 84 percent on the 1992 figure. The result of these recent large FDI inflows into the region is shown in that between 1988 and

1993, developing Asia almost doubled its total stock of inward FDI— an increase that no other developing region achieved. Now almost half of the total stock of FDI in developing countries is located within this region. Japan, the U.S.A. and the EU are the predominant sources of these FDI inflows. However the EU has the smallest stock amongst the Triad of FDI in developing Asia. In 1993 this was 12.9 percent of the total stock, lower than that of the U.S.A. and half of Japan's share of the region's FDI stock. Japan's share of inward FDI into developing Asian countries amounted to 21.0 percent of the region's total stock as Japan relocated some of its industries to lower-cost locations within Asia [5].

Table 7: FDI Inflows by the Triad into Developing Asia (\$ million and percent)

	1985-87		1990-93	
	Value	Share of total FDI	Value	Share of total FDI
EU	697	11.9	3,501	10.5
Japan	1,558	27.2	5,316	15.9
U.S.A.	1,299	22.7	3,686	11.0
Triad total	3,536	61.7	12,502	37.4
All countries	5,731	100.0	33,473	100.0

Source: UNCTAD and EC (5).

Annual average FDI inflow figures into the U.S.A., Canada and Mexico—the countries that were to become founder members of NAFTA—in the late 1980s averaged 44.3 percent of total world FDI inflows (see Table 3.6). But of this total inflow into the region the U.S.A. took 86.0 percent. Over the 1990s this proportion was to fall steadily, reaching its lowest level in 1993 when only 66.4 percent of the FDI inflows went into the U.S.A., but the U.S.A.'s share recovered in 1994 to 77.9 percent and in 1995 was 76.8 percent. Inflows into Mexico started from a low base point in the late 1980s being only 4.8 percent of the total. But in 1991 its share dramatically increased to 16.1 percent, and increased still further in 1992 to 16.6 percent. Indeed, from 1991 onwards, FDI inflows into Mexico were to become double the amounts that flowed in during the late 1980s, whilst by 1994 the value of Mexican FDI inflows was to double again. This indicates that, whilst the U.S.A. always attracts the vast majority of FDI going into this region, Mexico has become a more attractive location and is now rivaling Canada as a host for FDI inflows. Thus there has been some slight diversion effect on FDI inflows, although not strong. Moreover some of the inflows may well have gone in irrespective of NAFTA membership. FDI inflows into Mexico, however, are likely to increase still further in the future due to its lower-cost advantages compared with the other existing members of NAFTA, although any enlargement will again influence the choice of host country location within this RTB.

Table 8: FDI Stocks by the Triad in Developing Asia (\$ millions and percent)

	1980		1985		1993	
	Value	Share of total FDI	Value	Share of total FDI	Value	Share of total FDI
EU	4,779	16.4	9,058	17.2	29,846	12.9
Japan	7,313	25.1	13,090	24.9	48,607	21.0
U.S.A.	4,657	16.0	11,099	21.1	32,617	14.1
Triad total	16,748	57.5	33,248	63.2	111,070	48.1
All countries	29,115	100.0	52,645	100.0	230,933	100.0

A recent change in FDI flows has been the growing importance of South, East and South East Asia. Very significant amounts of FDI are now flowing into this region— the ASEAN group have attracted some inflows.

Table 9: FDI Inflows into Countries in NAFTA (\$ millions and percent)

	1984-89 Annual average	1990	1991	1992	1993	1994	1995
U.S.A.	86.0	82.2	76.4	66.4	81.4	77.9	76.8
\$ million	43,938	47,918	22,020	17,580	41,125	49,760	60,236
Mexico	4.8	4.4	16.1	16.6	8.7	12.5	8.9
\$ million	2,436	2,549	4,742	4,393	4,389	7,978	6,984
Canada	9.2	13.4	7.5	17.0	9.9	9.6	14.3
\$ million	4,718	7,855	2,740	4,517	4,997	6,043	11,182

The planned enlargement of the EU by the incorporation of new members (e.g. Poland and the Czech Republic) is also likely to affect FDI flows. Whilst current flows of FDI into Central and Eastern Europe are small, they are also concentrated into a few countries, some of which are the most developed and stable, and are due to join the EU shortly. So the surges going into Poland can be viewed in part as a strategy to establish a local market share and a cheaper EU location from which to service other parts of the EU. This is particularly true for Volkswagen which is faced at home by the highest European labor costs in Europe,

while Fiat have decided to use Poland, rather than Italy, as a location to implement their new strategy of achieving a greater degree of globalization of their business activities.

The planned expansion of NAFTA is to include Chile. In 1994, out of a total FDI inflow into Chile of \$2,533 million, 59 percent (\$1,502 million) came from NAFTA, with the remainder coming from APEC.

Future enlargement of both blocks is also likely. The EU will soon probably include most of Central and Eastern Europe and Turkey, and perhaps some of the North African countries bordering on the Mediterranean (e.g. Egypt which is an emerging industrial country in certain industrial sectors). FDI is already flowing into several of these countries, especially Turkey, which is the fastest growing economy in the region. Moreover Turkey, from 1st January 1996, has a Customs Union with the EU and has adopted its common external tariffs from this date, so has effectively become part of the Single Market. Further inflows of FDI into Turkey and other Mediterranean countries are likely to lead to a diversion effect of FDI from Western Europe and the U.K. to these areas. Further expansion of the EU may occur if the discussions between the EU and the representatives of the Mediterranean and Middle Eastern countries, held in November 1995, led to the successful introduction of a free trade block by the year 2000. The Middle Eastern countries are not at present members of the current regional trading blocks and, while geography might dictate a link with Europe, history and religion would push them more towards APEC.

NAFTA may well also expand to incorporate much of Central and South America over a longer time horizon, whilst APEC will surely quickly aim to accept India as a member. Enlargement of all three regional trading blocks will inevitably increase the FDI flows within blocks as each becomes bigger, whilst FDI flows between blocks will also increase—again at the expense of trade.

CONCLUSIONS

FDI flows are likely to continue to flow between the regional trading blocks, although the countries which provide this investment and the countries to which it goes are likely to change over time. FDI outflows from South East Asia are starting now. Very soon this area will become a major source of FDI, and the ascendancy of those mature OECD countries which in the past provided most of the FDI will soon be over. MNEs are likely to continue to undertake FDI within the regional blocks in order to continue to benefit from regional comparative advantage and also to overcome the external tariffs that are imposed on imports into the trading block.

CONFLICT OF INTEREST

There is no conflict of interest

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REFERENCES

- [1] Baker M, Foley C, Wurgler J [2009] Multinationals as arbitrageurs: the effect of stock market valuations on foreign direct investment. *Review of Financial Studies*. 22(1): 337–369.
- [2] United Nations Conference on Trade and Development (UNCTAD) [1995] *World Investment Report [1995] TNCs as Engines for Growth*, UN, Geneva and New York.
- [3] United Nations Conference on Trade and Development (UNCTAD) and European Commission [1996] *Investing in Asia's Dynamism*, European Commission, Brussels.
- [4] Dunning, John H. [1998] *Globalization Trade and Foreign Direct Investment*, Elsevier Science Ltd.
- [5] United Nations Conference on Trade and Development (UNCTAD) [1996] *World Investment Report, Investment, Trade and International Policy Arrangements*, UN, Geneva and New York.
- [6] Jones, Jonathan, Wren C. [2006] *Foreign Direct Investment*. Ashgate Publishing Limited.

ARTICLE

THE RELATIONSHIP BETWEEN CORPORATE COMMUNICATIONS AND JOB CREATIVITY WITH PERFORMANCE OF INSURANCE PRIVATE COMPANIES CITY OF BANDAR ABBAS

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ABSTRACT

Background: The study aimed to explore the relationship between Corporate communications and job creativity in employees' performance at private insurance companies of Bandar Abbas. **Methods:** It is an applied study in terms of purpose and a correlation type in terms of method. Population consisted all employed staff till end of 2014 in private insurance branches of Bandar Abbas which it was about 123 people. Because of some limitations, sampling was done randomly. Three standard questionnaire including: Robins questionnaire of organizational relations (2005), Rendsip job creativity questionnaire with 30 items, Baldrige model of performance with 25 items were applied to collect data. Descriptive and inferential tests of Kolmogorov-Smirnov test, Spearman Correlation and Linear Multi-variable Regression were used to analyze data. **Results:** Results show that there is direct and significant relationship between organizational communications and employees' performance at private insurance companies of Bandar Abbas ($r=0/359$, $p<0/01$). Also there is direct and significant relationship between job creativity and employees' performance at private insurance companies of Bandar Abbas ($r=0/282$, $p<0/002$). According to regression results about, creativity predicts positively performance for employees and has increasing effect on explained variance of performance ($Beta=0/216$, $p<0/05$). Also, Corporate communications predict changes in performance and has increasing effect on its explained variance ($Beta=0/504$, $p<0/05$). **Conclusions:** Eventually, it was found, based on moderate R^2 , that 13/2 percent of variance changes in performance is due to creativity and organizational relations.

INTRODUCTION

Organization survival and institutions depends on its efficiency and effectiveness on employees' performance. Fundamental changes in organizations were so rapid in the last decades so that organization managements have been more complicated than before. Human resource is the largest capital and source in organization of countries. Human resource is able to change cultural, social, political, and economic structures and so on. The reason for these changes depends on many factors, that one of the most important factors is organization management. Human resource role is known very important for all areas of activities. Therefore, the most important component in process of activities is human that make decisions, will do them and predict the sustainable activity based on them. In order to achieve organizations' purposes desirably, it is necessary to use human resource capabilities and provide also facilities to develop talents and increase efficiency in employees [1].

An organization manager must have behavioral traits, managing skills and abilities to maintain and keep his/her identity and effectiveness at the beginning of or during his/her responsibility [2].

Determining management success for goals is possible when performance is assessed carefully with existing methods and indicators at economic institutions. Researchers have shown that local management performance measurement is complicated and difficult. Two approaches interested in management performance assessment can be identified in studies about organizations and sociology. First area of study has focused on the concepts of efficiency, effectiveness and related indicators to them, second one, sociology, has focused on the effectiveness within the framework of social capital theory and its effect on organizational performance management [3].

But human economic attempts have been always focused on it to achieve maximum result from minimum attempts and facilities. It can be called as a passion to gain additional efficiency. Several studies show that performance balance for employees is not satisfactory in organizations and many problems arise from such shortcomings. Another important variable is organizational communications that can be associated with employees' performance. Relations and their orientations toward organizational goals are necessary issues for managers. Because managers have found out that effective relations with employees and understanding their motives for relations can be a vital factor to succeed for organizations' goals by managers. According to this issue and other studies, managers spend much time to communicate with people. Relations and communications allow employees to have interactions with each other at all levels of organizations, achieve desirable goals, be supported and take advantage from formal structure of organization. Relations, at organizational level also, lead to create cohesion and linkage between different parts of an organization and are associated with organization empowerment and promotions in missions and ultimately organizational performance improvement and desirable achievement. The importance of organizational relations is emphasized for managers, because relations and communications is observed obviously in all managers' activities [4].

KEY WORDS

Performance, Job Creativity, Organizational Communications, Insurance

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Maybe it is due to "communications" outputs that Careinz said management requires a kind of communication. Managers can motivate employees through effective communicating in organizations, provide bases for organizational performance improvement and consequently achieve strategic objectives [5].

On the other hand, there are various definitions for creativity that each one explain special point of view, for example Robins [6] defined creativity as a unique combination of ideas or a connecting the ideas , Lotanz(1992), believed creativity is a new mix of ideas and approaches by people or groups, also it is constantly felt necessary in organizations. Therefore, it should be institutionalized and become a part of culture and work in organizations. If superior managers and policy makers do not believe creativity and innovation as essential and vital activities in organizations, no activities will continue in this context. Creating innovative and research cores can simplify and accelerate creativity and innovation in organizations. Training is needed due to observe creativity as a common norm in organization and have common ideas about innovation [7].

So creative managers' characteristics and mechanisms for creativity strengthening can help employees and managers to take advantage from their intellectual, mental and mind abilities to make organizations dynamic and create, develop and apply creativity to strengthen spirit of scientific courage, criticism and research spirit in every single employees. It can turn the organization to a creative one that follows its employees' reviews of past processes, generating thoughts, ideas, goods and new services. And modernism as a fundamental value becomes as a part of common beliefs in the organization (Pirkhaleghi, 2005).

Indeed, continues innovation is a kind of regular exploration to find new ways and responses for environmental changes and pressures. Because in today's complicated environments, repeated reactions to face with changes are not efficient and must search for new ways constantly. In other words, those organizations and systems survive at complicated and changeable environments that continually can create and distribute new ideas and plans against environmental pressures [8].

Today, management and development experts emphasize on importance and position of performance and assessments models as one of valid indicators for developing society and organizations and also a vital key to achieve goals for social and personal dimensions of development [9]. Private insurance companies need communication improvements or at least proper communications with customers and creativity in services to attract more customers. This issue is related to efficiency, job quality and finally their performance. country Considering the necessity of organizational communications in management science literature, the vital role of performance and the importance to achieve its highest levels for managers and organizations, and the role of employees' creativity on organizational performance, some theories have been examined about mentioned variables on the basis of studies about effective communications, organizational creativity and organizational performance which were done inside or outside country. Also determination of communication types in private insurance companies, using effective communications, and studying organizational creativity rate and performance of organizations have been accomplished during the study. Therefore, the main question is that is there any significant relationship between organizational communications, job creativity and employees' performance at Bandar Abbas private insurance companies?

MATERIALS AND METHODS

The study purpose is applied. Also it is descriptive – correlative one. Population consist of all employed staff till the end of 2014 at private insurance companies branches that equals to 123 individuals. The population, totally, is selected randomly as a sample because of limited number of the statistical population.

In present study, following questionnaires were used to collect data:

In order to assess communications, a questionnaire was used with 13 items that is derived from Rabinz'[10] and data was graded by 5-scale Likert. The questionnaire was collected by Siegel (2001) and translated and credited by Moqimi [11]. Validity have been reported 89 percent.

Due to assess creativity, a questionnaire with 30 items, by Rendsip has been made and published for Staff Journal in 1979. It is a short form with single dimension. QahremanTabrizi and et.al (2005) have used retesting coefficient to assess its validity that it has been reported 92 percent.

Also, in order to assess organizational performance, a questionnaire was used with 25 items which is based on Baldrige Model and four dimensions including customer service, quality, efficiency and innovation. It is graded by Likert Scale. The questionnaire is derived from Haresy and Goldsmiths'(1980) and its reliability has been reported 87 percent by Moqimi and Ramezani [12].

Data analysis methods

Inferential and descriptive methods (Pearson correlation coefficient, linear multi-regression) were used to analyze results.

RESULTS

Inferential results

Necessary assumptions for multi-regression, and Pearson correlation coefficient are: normality of data distribution that is approved by Kolmogorov-Smirnov test. Results show that normality assumptions approved all variables and their dimensions ($p > 0/05$) except organizational communication variable ($p < 0/05$). The results have been shown in [Table 1]. Therefore, parametric statistics can be used for related calculations because number of subjects is more than 100 individuals [13]. Spearman correlation is applied because organizational communications are not normal.

Table 1: Single sample Kolmogorov-Smirnov Test results

Variable	dimensions	Sample volume	Test indexes	significance
Organizational communication	Active listening	123	4.33	0/21
	Multiple canals	123	2.31	0/101
	simplification	123	2.31	0.131
	Cluster communication	123	2.75	0.121
	Feedback and emotion control	123	1.46	0.213
	Total	123	2.18	0.027
Organizational Performance	Customer services	123	1.60	0.312
	quality	123	1.36	0.12
	innovation	123	1.06	0.201
	Total	123	1.46	0.435
Job creativity		123	2.13	0.956

Simultaneously, multiple regression has been used to explore linear relationship between variables (organizational communications and creation) and the variable (performance). According to [Table 2], results show that creativity predicts positively employers performance and has increasingly effect on its explained variance ($\text{Beta} = 0/504$ and $p < 0/05$). Eventually based on moderated R^2 rate, communication and creativity cause 14/6 percent of changes in performance variable variance at private insurance companies.

Table 2: Regression model coefficients

Predictor variables		Non-standardized coefficient B coefficient	Criterion error	Standardized coefficient Beta	t	P	R ²
stable		60.359	8.788		6.86	0.001	0.146
performance	Job creativity	2.704	0.237	0.216	6.416	0.008	
	Communication	2.769	0.243	0.504	1.648	0.007	

Spearman correlation coefficient has been used to study the relationship between organizational communication and employees' performance. The test results has been shown in the [Table 3]. Results of Spearman correlation test show that there is significant relationship between organizational communications and employees performance at Bandar Abbas private insurance companies ($p < 0/05$). This relationship is direct. According to the moderated r^2 rate, organizational communications explain 12/8 percent of changes in employees' performance.

Table 3: Correlation coefficient between organizational communications and performance

Variable	Performance Spearman correlation coefficient	Significance	numbers	Relationship	Relationship type	R ²
Organizational communications	0.359	<0.001	123	exists	direct	0.128

Spearman correlation coefficient was used to study the relationship between job creativity and performance. Results have been shown in [Table 4]. The results of Spearman test show that there is significant relationship between job creativity and employees' performance at private insurance companies ($p < 0/05$). The relationship is direct. According to the moderated r^2 rate, job creativity represent 7/9 percent of changes in employees' performance.

Table 4: Correlation coefficient between job creativity and performance

CONCLUSION

Variable	Job creativity Spearman correlation coefficient	significance	numbers	Relationship	Relationship type	R2
Job creativity	0.282	<0.002	123	exists	direct	0.080

Results of theories show that there is significant relationship between organizational communications and employees' performance at private insurance companies on Bandar Abbas ($p < 0/05$). The relationship is direct. Therefore, results of the study emphasize on communications role in formation of employees social capital that is similar to researches implemented by Majidi and Javadieh (2011). ZarghamiJafari and Akhavan [14] reported significant relationship between creativity and employees' motive. Ahmadi and Parsanejad (2001) reported significant relationship between creation and job satisfaction. Abaspour and Baroutian [4] reported significant relationship between organizational communications and performance. Communication is a process in which people interact in a certain way through message signal transferring. There are seven parts in a communication process: communication source, message coding, message, channel, result encoding, message receiver, result feedback, this issue is related to creativity and employees performance at private insurance companies of Bandar Abbas. The results of Spearman correlation indicate that there is direct and significant relationship between organizational communications and employees' performance. It means that as communications decrease or increase among employees, performance would be reduced or increased, as well. This finding is consistent with studies implemented by Haqiqatjou and Nazem [7] who believe creativity is significantly related to organization health and employees' efficiency, with Tassi, Horang, Lie and Hou [15] that emphasized on creativity importance on work environment, with Yan, Davison and Moue [16] and Han [17] who emphasized on importance of creativity formation among employees. Generally, communications are actions that cause to transfer ideas from a person to another one and be perceived and performed by them. Certain factor in all human communications is that employers must be more close and friendlier to employees for much more influence. They should be sensitive to other's perceptions about ideas and information, and remove words may slow down work process. So employers can be related to employees' performance changes.

Results of Spearman correlation indicate that there is a direct and significant relationship between job creativity and performance among employees at Bandar Abbas private insurance companies. It means that as communications increase or decrease in an organization, performance would be increased or decreased among employees of Banda Abbas private insurance companies. This finding is consistent with other researches including Elvis'(2008) that emphasized on importance of communication in organizations. To explain this finding, it can be mentioned that employees' point of views should be notable and welcomed, and appropriate conditions should be provided for issues related to organization. Also, employees' freedom for personal taste and idea to present their new ideas and do their duties can be related to much more performance

CONFLICT OF INTEREST

There is no conflict of interest.

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REFERENCES

- [1] Mardani SH, Nasirpour A, Nikoumaram H, Behzadi M and Mardani N. [2014] Relationship between job satisfaction and employees performance in Mold Industry. Two Iran Work Health Monthly Magazines, Period 10(6):107-120.
- [2] Asadi H, Nosrati A, Qorbani MH and Dousti M. [2009] relationship between learning and organizational performance in Islamic Republic Education Department employees, Sport Management, 1:237-247.
- [3] Imanipour N, Firouzabadi M. [2007] relationship between corporate entrepreneurship and performance (case study: sale agencies of Iran insurance joint-stock companies), entrepreneurship development, 1st year, 2:11-34.
- [4] Abaspour A, Baroutian H. [2007] relationship between effective communications and organizational performance in Departments of Iran national Gas Company, Human resource and management Chapter in Oil Industry, 4th year, 10:7-38.
- [5] Ahmadi A, Iranian S J Javad and Parsanejad M. [2001] The relationship between organizational creativity, job satisfaction and job stress in Fars Agriculture Department staff, organizational/

- industrial psychology news chapter, 2nd year, 8: 71-84.
- [6] Ahmadian M, Qorbani R. [2013] relationship between mind capital and organizational performance, Property and Economy Affairs Ministry, Economy Journal, 11 and 12: 111-130.
 - [7] Treacle AM, Thom KA, Furuno JP, Strauss SM, Harris AD, Pirkhaleghi A. [2005] creativity development principles and methods, Tehran: Phoenix publications.
 - [8] Moqimi S M, Ramezan M. [2011], Management research, first volume, Rahdan Publication, Tehran.
 - [9] Majidi N, Javadieh Z. [2011] role of organizational communications to form and attract staff social capital, communication culture, 4:165-190.
 - [10] Sarmad Z, Bazargan A, Hejazi E. [2009] research methods in behavior science, Tehran, Agah publication, 22 - 23.
 - [11] Zarghami H, Jafari M, Akhavan P. [2011] relationship between creativity and motive for innovation in research organizations: case study in institute of intelligent processing for symptoms, innovation, creative in humanity science, 1st year, 4: 38-63.
 - [12] Hon A H. [2011] Enhancing employee creativity in the Chinese context: The mediating role of employee self-concordance , International Journal of Hospitality Management: 30(2): 375-384.
 - [13] Yan Y, Davison R M. [2013] Employee creativity formation: The roles of knowledge seeking, knowledge contributing and flow experience in Web 2.0 virtual communities, Computers in Human Behavior: 29(5): 1923-1932.
 - [14] Hon A H. [2011] Enhancing employee creativity in the Chinese context: The mediating role of employee self-concordance , International Journal of Hospitality Management: 30(2): 375-384.
 - [15] Ivancevich, J.M. [2007] Human Resource Management. 10th edition, New York: McGraw-Hill.
 - [16] Tsai CH-Y, Horng J S, Liu C H, Hu D. [2015] Work environment and atmosphere: The role of organizational support in the creativity performance of tourism and hospitality organizations, International Journal of Hospitality Management, 46: 26-35.
 - [17] Zarghami H, Jafari M, Akhavan P. [2011] relationship between creativity and motive for innovation in research organizations: case study in institute of intelligent processing for symptoms, innovation, creative in humanity science, 1st year, 4: 38-63.

ARTICLE

EXAMINE THE RELATIONSHIP BETWEEN ORGANIZATIONAL LEARNING AND ORGANIZATIONAL PERFORMANCE WITH THE MEDIATING ROLE OF INTELLECTUAL CAPITAL (CASE STUDY: SOCIAL SECURITY ORGANIZATION)

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ABSTRACT

Background: The aim of this study is to examine the relationship between organizational learning, organizational performance and intellectual capital. **Materials and methods:** The population in this study consists of 159 employees of the Social Security Organization. Sampling of this study is simple random study and sample size is equal to 112 people using Cochran formula. Researcher has used from triple questionnaire that all the questions are Likert to collect data. In this study, the structural relations model was used to analyze the data. It was used to determine the validity and reliability of content validity and Cronbach's alpha coefficient that its amount was equal to 0.86 for organizational learning questionnaire Nife (2001) from 0.87 to 0.91 and for inventory organizational performance Hersey and Goldsmith intellectual capital Bontis (1998). It was used from Lisrel statistical software for data analysis and hypothesis testing and other analyzes in this paper. **Results:** The results showed that there has been a relationship between organizational learning and intellectual capital, also there is a significant relationship between intellectual capital and organizational performance.

INTRODUCTION

Achieve organizational goals depends on the ability of human resources in carrying out the duties assigned to them. Human resources are as one of the most important factors in advancing purposes and improving the productivity of organizations. Thus improving performance and optimizing human resource is a crucial need for organizations and according to organizational learning and intellectual capital are tools for achieving this goal. Organizational performance through the creation of empathy between the staff and the alignment between the goals and objectives of the organization and employees attempts to be created and therefore increases the productivity of the entire organization. The performance of the organization is more successful in achieving these goals, productivity increased and consequently the success and continuity will be guaranteed.

KEY WORDS

Organizational Learning, Organizational

If organizational performance has been assessed with requirements and prerequisites in organization, it can identify part of your organization problems and provide practical solutions to resolve them, it should be noted that there are a set of effective factors that affect the organizational performance.

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They adapt their employees to environment changing through organizational learning. Learning makes a person familiar with the insights and new concepts. Organizational learning occurs when organizational members use from learning to solve problems of their organization. Each organization has his methods for learning based on their own characteristics and [1]. Start of learning organization is thanks to the collective development of management theories such as Adam Smith, Taylor, and the learning curve[2]. Survival and development organizations in the changing world of today require the ability to timely and appropriate response to successive changes in the environment. Only organizations can anticipate needs and environmental changes in a timely manner, and their survival in a constantly changing environment to continue that emphasis on organizational learning [3].

On the other hand from a management perspective, intellectual capital means the knowledge, practical experience, organizational technology, communication and professional skills that bring competitive advantage in the market for the company and has impact on organizational performance. This definition scrutinizes people who make up the organization, structural dimensions and all connections to the organization. Although intellectual capital was before unknown, but now play a role in various forms in the process of economic, management, technology, and society development. The aim of this study is to explain the relationship between organizational learning and organizational performance with the mediating role of intellectual capital.

RESEARCH LITERATURE

Organizational performance

Organizational performance is to meet or exceed the social and organizational objectives and individual responsibilities have been assumed [4]. In the last two decades, organizational performance management is considered one of the fascinating topics. Information on performance, enabling organizations to gain competitive advantages [5]. Generally, factors affecting organizational performance can be described as

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follows: Organizational structure, organizational environment, policies and procedures of the organization environment. Works can be formally divided, grouped and coordinate using organizational structure. When the manager tried to come over planning the organizational structure should pay attention to the six elements or pillars. These include: the division of labor, job classification, the chain of command, control territory, according to the official ultimately centralized and decentralized tasks. Meaning of the word "environment" is unlimited and it includes all the things that are outside the organization. But the analysis made in this case. Just some aspects of the environment are concerned that the organization to which is sensitive and must reacts against them for its survival and rise of life. The organization's environment is defined as follows: All the factors that are outside the boundaries of the organization and has potential effects on all or a part of the organization [6].

Due to global competition, organizational performance evaluation is required for the survival of the organization and attention to performance measurement is important as a starting point for the development process. Each organization measure, monitor and analyze its own performance. The main reason for measuring performance is increasing the overall effectiveness of the organization and business processes. Hence, organizations invest in a lot of new resources, especially human and financial resources, and management systems function efficiently. Some performance measurement system is very complex enough that they let you pursue what happens in real time, and many organizations have taken steps to periodic review. Measuring organizational performance allows managers to focus on areas that need improvement (Vesna, 2008).

Organizational performance is defined as the expected value organizations conduct separate events that people are doing over a period of time [7].

Caldwell and Early (1990) showed that adapt of a person ability to the characteristics of the four required in the job analysis is instrumental for enhancing organizational performance [8].

Performance = function (ability and willingness)

Some experts extended this think by adding self-perception of their role or job recognition (Porter and Lawler, 1968, p. 18). These thinkers believed that employees may have desire and skills to do the job, but this factor is effective if we have good knowledge about what should be done and how is it.

Performance = function (ability and willingness and labor knowledge)

Some other experts have looked at this issue from another Angle and stated that efficiency is not merely a function of individual characteristics but also depends on the environment of organization [9]. People may be motivated severely and have all the necessary skills to do the job, but their effectiveness depends on the support and guidance of the organization, and they need to somehow comply with the needs of the enterprise environment.

Performance = function (ability and willingness, labor recognition, organizational support, environmental adaption)

Pundits recently have entered both feedback and reputation in management efficiency [10].

Organizational learning

It seems that the term "organizational learning" has been used by March for the first time in their preliminary study on the behavioral aspects of organizational decision making in 1963 [11]. But some believe that the attention of academic circles goes back to the 1950s on how organizations have been learned [12]. Regardless of the exact date of the start of organizational learning, it was attracted little attention until the late 1970s. At this time, a number of theorists focused on its activities on organizational learning [13,14]. Although research activities continued in the 1980s on the issue, in 1990 the issue of organizational learning is just one of the topics covered in the different fields of management like strategy and production management and from that day on, the debate of organizational learning is dominated by discussions of organizational learning new management was the subject of a learner organizations.

Due to up definition, we can say that organizational learning is not a fixed position or limit purpose; But a continuous process is adaptation to environmental conditions and evolution, in which groups within the organization are encouraged to develop the skills, knowledge and develop consensus about the destination [12].

Argyris and Schon (1978) have divided learning process into three categories single-loop, two loop, and Deuteron learning. In the Figurdo's opinion (2002) Learning in organizations has four sub-process of knowledge acquisition from outside the organization, the acquisition of knowledge within the organization, generalization of knowledge and encrypt and development of knowledge. Chu (2004) note that key facilitators of organizational learning are interaction and communication between team members, job rotation and experience, including interaction and communication, the direction and rate of flow of information and experience among the group members. The group job to be able to change jobs in the real exchange between Members refers [15]. Some researchers also emphasize that organizational learning is a major component of the learning organization and is necessary to do that factors related to organizational culture, as entrepreneurship, innovation and knowledge of the market and the factors related to organizational climate, such as dynamic structure, leadership facilitator, decentralized strategic planning and knowledge workers human resources [16]. The results of previous research have shown that information and knowledge has a positive effect on organizational learning [15].

Apparently the so-called organizational learning referring to individual learning in the organization, but organizational learning refers to the group or organizational-level learning. Individual learning is done by reading, interviews, knowledge, experience, practice and develop effective mental models in the mind, However, organizational learning occurs when the group learns to interact, share knowledge and to act collectively so that obtain the combined capacity of the group increased and ability to understand and taking effective action [17].

Organizational learning dimensions are as follow from the perspective of Nife (2001):

Shared vision: the importance of shared vision to become a learner organization: First, the shared vision provides focus and energy for learning. Second, the prospects lead people to action. Outlook indicates their aspiration and dreams and gives meaning to them. Thirdly, the attraction is toward higher desired goal with governing force against the status quo. Shared vision creates the ultimate aim to encourage risk-taking and innovation. Fourth, shared values and meanings are important to determine the kind of knowledge that organizations store and pass [18].

Organizational learning culture: When the members of any society, organization or group try to adapt to the external environment and internal integration problems, they have taken action unconsciously. Because of it, they are not only different in terms of theory, learning and problem solving, but also we should say that different viewpoints have the same basic process.

Team work and learning: Underlining on the importance of team work and learning in the alignment of forces and personnel to avoid wasting energy. Collective learning is a process in which the capacity of the members of the group have been developed and aligned in such a way that the results be what everyone really wanted was to have [19]. Knowledge sharing, transfer and distribution of knowledge, organizational transfer and technological data, includes information and knowledge. The organization's capacity to mobilize knowledge indicates the ability of transfer and the sharing of power that is necessary for success. Knowledge must accurately and quickly distribute throughout the organization or balls Enterprises [18].

Systematic thinking: Systemic thinking means using from systemic method in analysis and corporate governance and attention to the impact of organizational factors on each other. With a holistic thoughtful, business activity and, in general, all other human endeavors are system. They are limited by made activities associated with each other are limited, activities that usually require several years to complete the encapsulation influence. Because of that we are also part of the set, in order to understand the pattern of change we face additional challenges [19].

Participatory leadership

Participatory leadership subsequent is having employee participation feeling. The result of this effort is that staff feels they are needed and have a useful existence. Research has proven that participation reduce resistance to change, increases commitment to the organization and go down the stress level.

Staff competencies

Competence in human resources literature is a collection of knowledge, skills and observed and measurable behaviors that contributed to the success of a job or post. For proper management of human resources, we should improve significantly knowledge, information, skills and capabilities of staff and their competencies and create competency in them, Human resource development cannot be obtained with a lot of training, but also human resources should act with a planned and systematic method.

Intellectual Capital

Intellectual capital is an interdisciplinary concept and its understanding is diverse in disciplines related to business and commerce [20]. There is little agreement on the understanding of intellectual capital. The resulting revolution in information technology, the importance of increasing knowledge and knowledge-based economy, changing patterns create a network of community as well as the emergence of innovation as the most important determinants of competitive advantage including those that enhance the intellectual capital of the Company has provided more than before [21]. Bontis (1999) defines intellectual capital as a set of intangible assets (resources, capabilities, and competition) and achieved organizational performance and value creation. In other words, in Bontis' opinion, intellectual capital means the collection of intangible assets and their flow. Bontis believes that component of intellectual capital with impact on each other; determine flow or the way of company's value creation [22]. Advinson and Malone (1997), define intellectual capital as knowledge and information used to work, a way of value creation [23].

-Intellectual capital components

Brookings (2002) has provided intellectual capital in a more comprehensive framework, the framework includes the following categories in the intellectual capital [24].

- Market assets (including manufacturing and customer loyalty services and brands)
- Intellectual property (including patents, formulas Series and the like)
- Human-centered assets (including training, working knowledge and professional characteristics ...)
- The underlying assets (management philosophy, corporate culture, network systems, etc.)

But the general definitions that seem wider acceptance and have been accepted by the academic

community include the following three components.

- Human Capital
- Structural Capital (organizational)
- Relational capital (customer)

Human capital

Human capital is inventory of organization's knowledge. Ross et al (2004) argue that employees cause intellectual capital through competence [25], attitude and intellectual agility [26]. The most important elements of the organization's human capital is workforce skill sets, depth and breadth of their experience. Human resources can be as thought of a soul and intellectual capital resources. This capital exits at the end of the workday to leave the organization by employees outside the company.

Human capital includes

- Skills and competencies of the workforce
- Their knowledge in fields that are essential for organizational success
- It is their talents and conducts them.

Structural capital

Structural capital includes all of non-human resources knowledge in organization that includes data-bases, organizational charts, and operating instruction and generally everything its worth is higher than material value for organization. Bontis (1998), introduces structural capital in the guidelines, strategies, policies and what makes the organization more than its physical value. According to Bontis, intellectual capital is not reached to their full potential in a corporate with weak ways. Structural capital covers a wide range of essential elements. The most important include:

- Important Executive processes
- How to structure them
- Policies, information flows and database elements
- Leadership and management style
- Corporate Culture
- Employee bonus plan

Relational capital (customer)

Relational capital includes all items that exist between organizations of any person or other organization. These people and organizations can include clients, intermediaries, employees, regulatory authorities, communities, creditors, investors and so on. Customer capital deemed as a bridge and operations intellectual capital organizations and intellectual capital becomes a determining factor in market value.

This investment includes strength and loyalty customer relations. Bontis (1998) states that the new definition, the concept of customer funds that existed before to have developed relational capital which contains knowledge in all relationships that organization established with customers and competitors, suppliers, trade associations and government. Customer capital deemed as a bridge and operational intellectual capital of organizations and intellectual capital becomes a determining factor in market value. This investment includes strength and loyalty customer relations.

In general we can say that the basic and most important components of intellectual capital are human capital and other capital function of human capital. In fact, grow and expand is limited without the human capital.

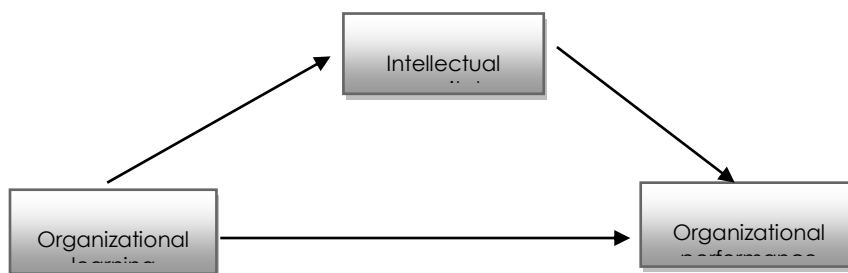


Fig. 1: Conceptual model

Hypotheses

- 1-There is a significant relationship between organizational learning and intellectual capital.
- 2-There is a significant relationship between intellectual capital and organizational performance.
- 3-There is a significant relationship between organizational learning and organizational performance.
- 4-There is a significant relationship between organizational learning and organizational performance through intellectual capital.

MATERIALS AND METHOD

Required data for the study have been collected from a questionnaire that its reliability was tested. Researcher are used from questionnaire that all the questions are as Likert to collect data. This data is analyzed by LISREL software. The population in this study consisted of 159 employees of the Social Security Organization. Sampling of this study is simple random study and sample size is equal to 112 people using Cochran formula. Researcher has used from triple questionnaire that all the questions are Likert to collect data. In this study, the structural relations model was used to analyze the data. It was used to determine the validity and reliability of content validity and Cronbach's alpha coefficient that its amount was equal to 0.86 for organizational learning questionnaire Nife (2001) from 0.87 to 0.91 and for Inventory organizational performance Hersey and Goldsmith intellectual capital Bontis (1998). In this study, after drawing analytical model, study is obtained based on data by the program with performances Perlis Path diagram LISREL software measurement model in which hypothesis has been tested using B coefficient and t test. The model fit indexes with performances Perlis is also automatically calculated for the model.

Data analysis

Table 1: Research model fit indices

estimated amounts	Standards amount	Fit index
626	-----	Degrees of Freedom
2217.10	It is not a proper index due to dependence to sample size	Chi-Square
0.083	0.05	RMSEA
0.91	0.90	NFI
0.94	0.90	NNFI
0.95	0.90	CFI
0.058	0.05	RMR
0.70	0.90	GFI
0.71	0.90	AGFI

As shown in [Table 1], can be seen, the indicators of adaption or goodness of fit are in a relatively acceptable level.

Testing the structural model

In this study, it was used from confirmatory factor analysis to test the measurement model and path analysis confirmed the structural model. Two following figures show the overall model output of LISREL software that at the same time involving the structural model and the measurement model that the more they will be examined in detail and resolution.

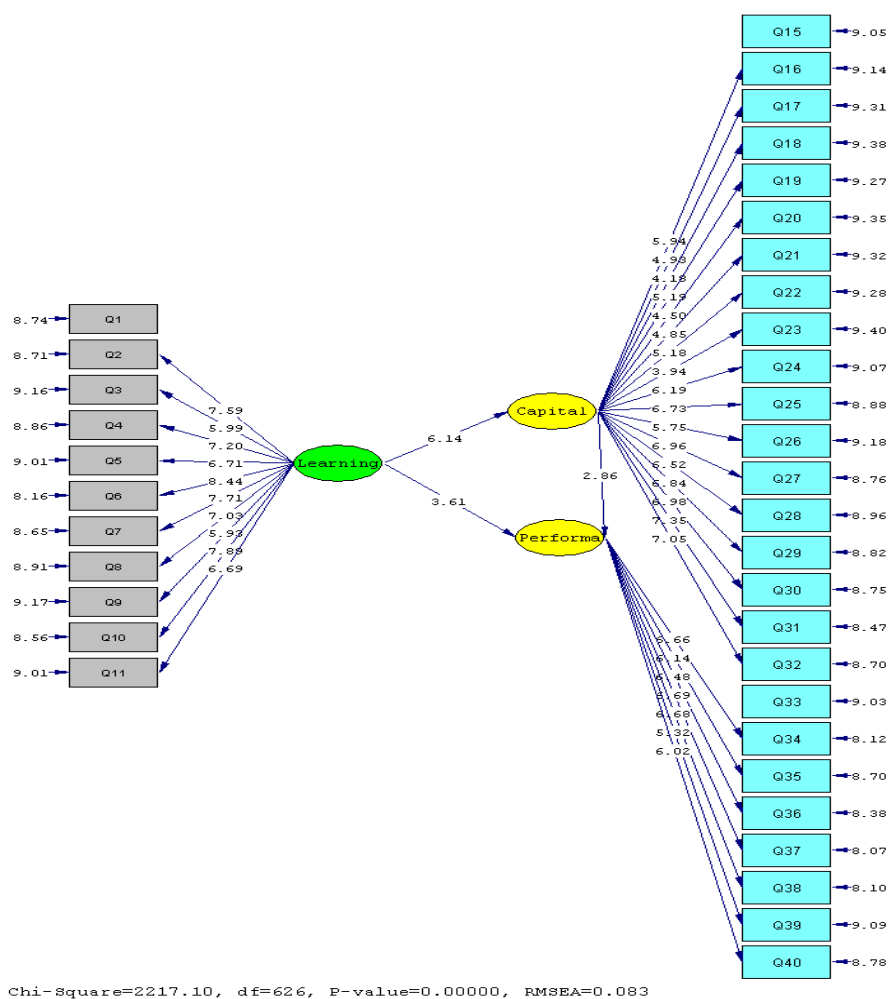


Fig. 2: The base model with T values

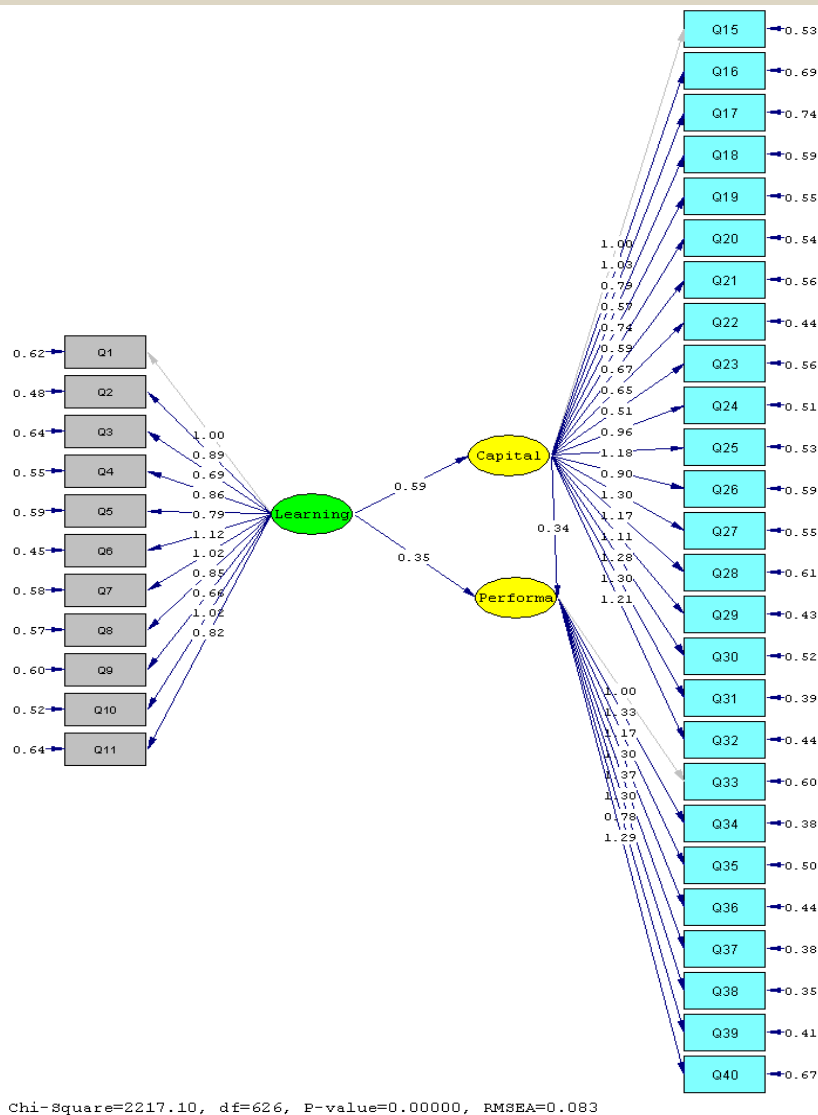


Fig. 3: The base model with path coefficients

RESULTS

First hypothesis

There is a significant relationship between organizational learning and intellectual capital.

Table 2: Results of the first hypothesis test

Hypothesis	Coefficient	T statistics	Result
There is a significant relationship between organizational learning and intellectual capital.	0.59	6.14	Acceptance

Based on the results shown in [Table 2], the influence of the independent variable on the dependent is supported by the data and the way that relates these two variables together is a positive and meaningful in general (at the level of 5% significance) ($t = 6.14, \beta_{22} = 0.59$), as a result, one can say with 95% confidence, there is a significant relationship between organizational learning and intellectual capital.

The second hypothesis

There is a significant relationship between intellectual capital and organizational performance.

Table 3: results of the second hypothesis

Hypothesis	Coefficient	T statistics	Result
There is a significant relationship between intellectual capital and organizational operation.	0.34	2.86	Acceptance

Based on the results shown in [Table 3], the effect of the independent variable on the dependent is supported by the data and the way that these two variables together in general is positive and significant (at the level of 5% significance) ($t = 2.86, \beta_{22} = 0.34$). As a result, one can say with 95% confidence, there is a significant relationship between intellectual capital and organizational performance.

The third hypothesis

There is a significant relationship between organizational learning and organizational performance.

Table 4: The third hypothesis test results

Hypothesis	Coefficient	T statistics	Result
There is a significant relationship between organizational learning and organizational operation.	0.34	2.86	Acceptance

Based on the results shown in [Table 4], the effect of the independent variable on the dependent is supported by the data and the way that these two variables together in general is positive and significant (at the level of 5% significance) ($t = 3.61, \beta_{22} = 0.35$). As a result, one can say with 95% confidence, there is a significant relationship between organizational learning and organizational performance.

The fourth hypothesis

The relationship between organizational learning and organizational performance due to the significant intellectual capital.

Table 5: The fourth hypothesis test results

Hypothesis	Path Coefficient	Result
There is a significant relationship between organizational learning and organizational operation through intellectual capital.	$0.59 \times 0.34 = 0.20$	Acceptance

The results of test of hypothesis 4 is considering according to information in [Table 5]. Possible involvement of intellectual capital between organizational learning and organizational performance such that, if confirmed a direct impact of organizational learning on intellectual capital, as well as the direct impact of intellectual capital on organizational performance be confirmed and dependent impact of intellectual capital can be confirmed between organizational learning and organizational performance. The coefficient of latent variables of organizational learning endogenous on endogenous variables is 0.59 and T valued is significant at a significant level equal to 6.14, 0.95, 0.05 with confidence statistic and endogenous latent variable coefficient of intellectual capital on organizational performance endogenous variable t value of 0.34 with the confidence of 0.05, 2.86 0.95 with confidence statistics to be meaningful. The effect of intellectual capital in mediating role between organizational learning and organizational performance is equal to $0.59 \times 0.34 = 0.20$ and the researchers' claim is confirmed.

CONCLUSION

The results of the hypotheses indicated that the path coefficient between organizational learning and intellectual capital equal to 0.59 and 1.96 of the corresponding $t < 6.14$ is tested in accordance with the critical mass of 0.05 in the 95% confidence level the null hypothesis can be ruled out. As a result, the first claim of researchers has been approved and one can say with 95% confidence, there is a significant relationship between organizational learning and intellectual capital.

The second hypothesis results showed that the path coefficient between intellectual capital and organizational performance equal to 0.34 and 1.96 of the corresponding < 2.86 , which according to t test with critical value 0.05 at the 95% confidence level the null hypothesis can be ruled out. As a result, second researchers' claim has been confirmed and one can say with 95% confidence, there is a significant relationship between intellectual capital and organizational performance.

The third hypothesis results showed that the path coefficient between organizational learning and organizational performance equal to 0.35 and the corresponding amount of $1.96 < 3.61$, which according to t test with critical value 0.05 at the 95% confidence level the null hypothesis can be ruled out. The third researchers' claim was therefore confirmed and one can say with 95% confidence, there is a significant relationship between organizational learning and organizational performance.

The fourth hypothesis results showed that the path coefficient between organizational learning and intellectual capital equal to the amount corresponding 0.59 and $1.96 > 6.14$ and the path coefficient between intellectual capital and organizational performance equal to 0.34 and the corresponding $1.96 > 2.86$, which according to t test with critical value 0.05 at the 95% confidence level the null hypothesis can be rejected. As a result, the impact of intellectual capital intermediary role between organizational learning and organizational performance equal to $0.59 \times 0.34 = 0.20$ and the fourth claim of researchers is confirmed.

CONFLICT OF INTEREST

There is no conflict of interest.

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REFERENCES

- [1] Fang ch W kankanhalli A, Ang C. [2008] Investigating organizational learning in e-Government projects: A multi-theoretic approach; J of strategic Information systems 17,99-123,114-122.
- [2] Templeton GF, Lewis BR, Snyder,C A. [2002] Development of a Measure for the Organizational Learning Construct", J of Management Information Systems, 19:175- 218.
- [3] Khan Ali Zadeh, Roghayeh, Kordnayich, Asadullah, Moshabbaki A. [2010] the relationship between empowerment and organizational learning, change management J, Issue III.
- [4] Hersey P, Blanchard K. [1994] organizational behavior, management, translation Qasim Kabiri, China fourth, Press Institute (SID).
- [5] Vesna B-V, Ljubica M. [2008] Organizational Performance Measures for Business Process Management: a Performance Measurement Guideline. Kardeljeva, I- 17.
- [6] Daft RL. [1995] Organization theory and design, Business & Economics - 611.
- [7] Senior N. [2007] Design and test a model of the antecedents and consequences of work motivation in the National South Oil Company employees Ahvaz region. Psychology doctoral thesis, Faculty of Education and Psychology martyr Chamran University.
- [8] Carmeli A. [2005] Exploring determinants of job involvement: an empirical test among senior executives. International J of Manpower, 26: 457-472
- [9] Rogelberg, SG. [2007] Encyclopedia of Industrial and Organizational Psychology , 1. Sage Publications
- [10] Hersey P, GoldSmith M. [1980] A Situational approach to performance planning , Training and Development ,34.
- [11] Dawes, PL. [2003] A model of the effects of technical consultants on organizational learning in high-technology purchase situations, The J of high Technology Management Research;14: 1-20.
- [12] Bayraktaroglu S, Kutaniz RO. [2003] Transforming hotels into learning organizations: a new strategy for going global, Tourism Management; 24:149-154.
- [13] Argyris C, Schon D. [1996] Organizational learning II, theory, method, and practice; Addison-Wesley, Reading.
- [14] Argyris C, Schon D. [1978] Organizational learning: a theory of action perspective; A: Addison-Wesley.
- [15] Choe JM. [2004] The relationships among management accounting information, organizational learning and production performance, Strategic Information System; 39:61-70.
- [16] Engelhard J, Nagele J. [2003] Organizational learning in subsidiaries of multinational companies in Russia J of World Business; 38:262-277.
- [17] Bennet A, Bennet D. [2008] The partnership between organizational learning based on knowledge management.
- [18] Marquardt M. [1995] Building the global learning organization in best practices in learning organizations: Measuring the Reality.
- [19] Senge P. [1990] The Fifth Discipline: The art and practice of learning organization. Doubleday Dell; New York.
- [20] Huang Ching C, Luther R and Tayles M. [2007] An evidence-based taxonomy of intellectual capital. J of Intellectual Capital, 3:386-408.
- [21] Anvary Rostami AA, Seraji H. [2005] Measuring intellectual capital and the relationship between intellectual capital and market value of shares of companies of Tehran Stock Exchange.
- [22] Bontis N. [1999] Managing Organizational Knowledge by Diagnosing Intellectual Capital: Framing and advancing the state of the field", International J of Technology Management, 18(5/6/7/8):433-462.
- [23] Edvinsson I. [1997] Developing intellectual capital at Scandia, long Rang planning, 30(3):320-331.
- [24] Brookinng A. [2002] Intellectual capital core asset for the third millennium enterprise. London:international Thompson Business Press.
- [25] Roos G, Roos J. [2004] Measuring Your company s Intellectual Performance, Long Range Planning, 30(3): 413-426.
- [26] Qlych Li B, Moshabbeki A. [2006] The role of social capital in developing intellectual capital of the organization (the two Iranian car company), Knowledge Management, 75(XIX): 147-125.

ARTICLE

THE FACTORS AFFECTING THE LEVEL OF INFORMATION DISCLOSURE OF LISTED COMPANIES IN TEHRAN STOCK EXCHANGE

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ABSTRACT

One of the objectives of financial reporting is preparation and delivery of information to provide the basis for investors and creditors to make decision. In this regard information should be useful, relevant and has the ability to influence economic decisions and leads to the best decision. On the other hand financial information should be disclosed appropriately to be useful in decision making and access to this information should be possible for everyone. The main objective of this research is to study the factors affecting the level of information disclosure of listed companies in Tehran Stock Exchange. This is an applied research and the method of data collection is descriptive. The sample of the study is all companies listed on the Tehran Stock Exchange. 82 companies during 2009_2014 were selected to test the hypotheses of the study. To evaluate the effect of independent variables on the dependent variables six hypotheses were tested. To analyze the results Eviews 7 software was used. The effect of the independent variable on the dependent variables in this study was based on the combined data and using multivariate regression. The results showed that there is a significant relationship between assets, sales, financial leverage, profitability, and liquidity with information disclosure level of listed companies in Tehran Stock Exchange.

INTRODUCTION

KEY WORDS

information disclosure, sales, profitability, age of company, stock exchange, Tehran

Companies may have to disclose their information to limit the unfavorable investors' image and create awareness about the future prospects of the company. Providing information on the recognition, measurement and disclosure of the accounting items in the financial statements is to attract investors and effectively improve the financial condition and management. The purpose of the research is to study the factors affecting the level of information disclosure of listed companies in Tehran Stock Exchange, disclosure is meant to provide information. Accounting disclosure is meant to provide information on a company's financial year. Dissemination of information on the balance sheet, income statement and cash flow statement is often considered as the recognition and measurement. So disclosure includes management discussion and analysis, notes with financial statements and supplementary statements. Disclosure of the information is providing the legal requirement information in excess. Company's management is free to provide accounting information and other information which may facilitate and provide the appropriate needs of users. Companies may disclose their information to limit the negative perceptions of investors and create awareness about the future prospect of the company [1].

Providing information on the recognition, measurement and disclosure of the accounting items in the financial statements can attract investors and effectively helps to improve financial condition and company management. Disclosure reduces uncertainty. This reduces the need to monitor management activities and reduces the cost of financing and increasing the company's value [2].

Each business unit to continue its activities require working capital and to develop activities and increase profitability will inevitably lead to new investment. Working capital and new investment are done through financing. Financing and investing in companies are decisions that are made with foresight. In financing decision, Companies use funds to be able to meet their obligations towards funds suppliers in future [3]. Financing is possible from various sources, including borrowing and capital increase. Financing is with the cost of capital for the business unit and financing by borrowing requires the business unit to pay interest. Financing through capital increase makes the business unit committed to pay dividends. The purpose of management is to increase corporate value and increase shareholder wealth. Whatever the business efficiency is less than the cost of capital, corporate value and shareholder wealth consequently becomes more. Information disclosure attracts investors and reduces the cost of financing companies. Reducing the cost of financing will follow growth and profitability [4]. Investors' better understanding of the director regarding anticipating economic changes will increase the company's value. So managers can voluntarily provide information about the company's future economic environment and providing management earnings forecasts increases shareholder value and thus increases company's competitive position in the industry in the capital market. However, voluntary disclosure adds to the commercial advantages, it also composes costs on the company. In this regard, voluntary disclosure theory suggests that managers, in the interests of disclosure on the costs of excess, will disclose information. Thus, according to statement contained, Disclosure of information by corporate executive can affect companies' performance and profitability [5]. One of the most important factors for sustainable development in the economy of any country is providing basic infrastructure to attract domestic and foreign investment. This is possible with a healthy competitive environment through transparent and timely information and allowing all market participants to provide clear information. If dissemination of information is done more and better in communities, ability to make informed decisions and take responsibility on education and resources use

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will increase. So one of the requirements of economic growth and development is that all stakeholders have access to transparent information users of financial information need accurate and timely information to invest and make decisions [6].

Companies that do not have acceptable and transparent financial reporting face credit risk and lose shareholders confidence under such circumstances eventually, the credit and liquidity sharply decrease in the whole market. In fact, in the long run the main condition in booming capital markets is transparent information environment. Transparency and disclosure of information reduces uncertainty and thus reduces the expected returns and cost of capital which can make the company grow, develop and constantly improve (Izadinia et al, 2015). There are a lot of researches about reducing the cost of capital in the wake of increasing information transparency and quality of information disclosure. In these researches the legal system, the efficiency of the judicial system, the protection of property rights, political economy and government intervention in the financial markets in each country have been identified as variables affecting the quality of disclosure. However, different companies in the same country and even within the same industry, despite similar environmental conditions, the amount of information transparency and adopted disclosure policies act differently. Many world-class researches evaluate the effect of the level of transparency and disclosure within the company trying to clear up the issue. Different researches studied the following variables impact on the company information disclosure and transparency and have achieved different results: the size of the company, ownership structure, profitability, company's age, the external activities, financial leverage, liquidity ratios, and other factors. The impact of these variables on disclosure of corporate information remains uncertain. In other words, the observed relationship between some of these variables with transparency and the quality of disclosure was different in various researches [7].

Finance and sales in this study were studied as two representatives about firm size. Larger companies are subject to scrutiny and review by the general public more than smaller companies and in this sense are willing to disclose much more information. Larger companies have more resources to collect, analyze and provide extensive information with minimum cost. More information disclosure allows larger companies to obtain more funds with lower cost of equity. Corporate agency costs more for larger companies, because shareholders are widespread and more information disclosure reduces potential price representation. Financial leverage is one of the variables that are associated with the disclosure of information (Izvercian&Potra, 2014). Many specialists believe that companies with high debt leverage are prone to higher agency costs and have to disclose more information to meet the information needs of creditors. The financial leverage can directly affect the disclosure of information (Landsman et al, 2012). In countries where financial institutions are primary source to supply companies high debt companies are reported on the balance sheet, and therefore more information is disclosed in the annual reports. In addition, such companies tend to provide more detailed reports to get funds from financial institutions (Hajianetal, 2015). Profitability is another variable which according to several studies is one of the most important factors affecting the company's information disclosure (Izvercian&Potra, 2014). In this study, the return on shareholder equity was studied as profitability representative. The ratio studies the company's performance in creation of net profits for shareholders. In fact, this ratio expresses the shareholders net profit with a Rial investment in the firm (Sehat et al, 2011). Higher profitability makes management disclose more information to demonstrate its ability in management bonuses and the increase in shareholders capital. In return managers who experience low profitability feel threatened and try to wipe the results of failure with less information disclosure (Hajian et al, 2015). Age and liquidity are other factors in this study that have been mentioned as factors affecting the disclosure of information [8].

The above mentioned relations were studied in more than twenty countries. The relationship between firm size, leverage, profitability, liquidity, and firm age with information disclosure of listed companies in Tehran Stock Exchange was studied using multiple regressions. The results of this study, in addition to reducing uncertainty help to determine the impact of the two new proposed factors. The two new factors are firm age and liquidity. Understanding the factors influencing the quality of disclosure can be used to identify obstacles to the transparency of corporate information and improve notification. Finally capital market will be more efficient and investors decide more informed and more rational regarding the allocation of financial resources to companies. The main research question is what are the factors affecting the level of information disclosure of listed companies in Tehran Stock Exchange?

The theoretical framework and measurement

In this study, the model of Hajian and et al (2015) was used. In this model independent variables include assets, sale, financial leverage, profitability, firm age, and liquidity. The dependent variable is information disclosure. The regression model of the study:

$$Dscore_{it} = \beta_0 + \beta_1 LogASSET_{it} + \beta_2 Log REV_{it} + \beta_3 LEV_{it} + \beta_4 ROE_{it} + \beta_5 AGE_{it} + \beta_6 LIQ_{it} + \varepsilon$$

DSCORE_{it}: Company *i* disclosure score for a period of 12 years leading to the end of the *t* year which is calculated 100 units by the Exchange Organization.

LogASSET_{it}: The logarithm of the total assets of *i* company in its balance sheet at the end of *t* year.

Log REV_{it}: Logarithm of the total income of *i* company during the fiscal year ended March 19 of the *t* year.

LEV_{it}: Non-Current debt ratio to the assets of company *i* in its balance sheet at the end of the *t* year

ROE_{it} : Return on the capital of i company during the fiscal year which ended in March 19 of the t year

AGE_{it} : The age of i company since the establishment by the end of t year

LIQ_{it} : Company i liquidity at the end of t year

ε : Regression error model

How to measure variables

Total assets: the company's total assets is calculated by logarithm

Total sales: total sales are calculated of total revenues logarithm

Financial leverage: It is defined with the total debt to total assets ratio at the end of period

Profitability: In this study, share holders return on equity is achieved by dividing net profit after tax on equity

Firm age: this variable is equal to the number of years since the founding of the company until the year of the study

Liquidity: Liquidity variable consists of current assets divided by the current debt

Disclosure of Information: to measure the variable of information disclosure, the calculated annual rankings by Stock Exchange Organization were used

These points reflect stock assessment about the extent of awareness and the quality of corporate disclosure.

Hypotheses

According to scientific relationships between the variables, there are six hypotheses. The six hypotheses are as follows:

1. There is a significant relationship between the total amount of assets and the disclosure of information in companies listed on Tehran Stock Exchange
2. There is a significant relationship between the total amount of sales and the disclosure of information in companies listed on Tehran Stock Exchange
3. There is a significant relationship between financial leverage and the disclosure of information in companies listed on Tehran Stock Exchange
4. There is a significant relationship between company's profitability and the disclosure of information in companies listed on Tehran Stock Exchange
5. There is a significant relationship between company's age since establishment and the disclosure of information in companies listed on Tehran Stock Exchange
6. There is a significant relationship between company's liquidity situation and the disclosure of information in companies listed on Tehran Stock Exchange

MATERIALS AND METHODS

The study is based on applied research. The aim of applied research is gaining the necessary knowledge to determine tool whereby the specific and known needs will be resolved. This research is descriptive in terms of how data collection is. This paper describes the characteristics of the sample and then extrapolated these features to the statistical community. Descriptive research includes a set of methods that aim to describe a situation or phenomenon which is being investigated. In order to collect information data field method and Rahavard Novin database were used. The company's financial statement such as balance sheet and income statement were used as a research tool. Descriptive statistics of the study is based on statistics and statistics of central tendency. For data analysis, the degree of each variable was determined based on data included in the financial statement. Then the collected data was described and the hypotheses were tested and finally ended with a summary and analysis of information. Data analysis was done based on Eviews 7 software. The study population includes all listed companies in Iran's Stock Exchange during the study years with the said conditions. To determine samples in this study, giving the multiplicity of stock companies, type of activity, and various sizes, the systematic elimination method (screening techniques) was used. Conditions were defined to homogenize the sample and companies are considered to be among the sample that has the defined conditions. Of all the company stock, companies that have all the following conditions during the years 2009-2014 are considered as samples.

1. Companies that are listed on the stock exchange since the beginning of the year.
2. Information about the company for the variable should be available during the study
3. Service companies, finance, and investment companies are not included because these companies have different capital structure than other manufacturing companies
4. Company stock does not have interval trading during the study years
5. Company's fiscal year ending 19 of march and the company has not changed its financial year during the study years

According to the above restrictions 82 different companies were studied. These companies were in stock during 2009-2014. The number of observation equals to 492 years of the company.

Table 1: The number of companies removed at any stage of limitations

Number of remaining companies	Limitation
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435	Unlimited
381	Since the beginning of 1388 are listed on the stock exchange
294	The information required to variables about the company is available during the study period
217	Service companies, finance and investment companies are not included because these companies have different structure than other manufacturing companies
137	Company stock is not being traded in an interval way during study years
82	<p>Company's fiscal year ending on March 19 and the company has not changed its fiscal year during study period.</p> <p>82 companies were assessed according to the above limits 82 companies were studied. These companies were in stock during 1388-1393 and the number of observation equals to 492 years of company.</p>

To analyze the data, two ways were used

Central scattering index such as mean, redundancy, standard deviation, and.... are used to describe variables.

Multivariate regression analysis is used to test hypotheses. After appropriate data classification, calculation and initial processing correlation test was used to determine the reliability or stability of variables. To run the model and hypothesis testing Eviews version9 was used.

RESULTS

Hypotheses test and results

The sample includes 82 companies during 2009-2014. The mean, median, (central criteria), standard deviation, maximum, and minimum (measures of distribution) and the calculated variables are presented in [Table 2]. It is necessary to mention after sorting data, the years of study variables and the number of companies decreased slightly.

Table 2: descriptive indicators of variables

Variables of the study	minimum	maximum	median	mean	Standard deviation
Information disclosure level	-6	96	67.5	65.89	25.38
Logarithm of assets	4.82	8.31	5.91	6.03	0.71
sale	4.96	8.77	5.88	5.95	0.67
Financial leverage	0.00	0.83	0/07	0.094	0.13
profitability	-8.94	6.81	0.31	0.29	0.79
Company age	10	40	62	39.85	13.11
liquidity	0.33	7.48	1.29	1.42	0.66

Testing normality of the dependent variables

Jarek test was used to assess the normality of variables. The results of Jarek test are presented in [Table 3]. According to the test the level of significance is less than 0.05, and the dependent variables are not normally distributed. However, when the sample size is large enough, deviation from normality assumption is usually unimportant and its consequences are negligible. According to the Central Limit Theorem, even in the absence of normality, test statistics will follow the appropriate distribution asymptotically. Therefore the lack of justification for this assumption is negligible.

Table 3: Jarek test

variable	Jarek statistic	Level of significance
Information disclosure level	10.074	0.000

The reliability of variable

Before analyzing research data, the reliability of the variables should be mentioned. The reliability of variables means that the mean and variance of variables have been stable over time so has been the covariance of variables between different years. Using these variables in the model does not cause spurious regression. For this purpose, tests such as Levin, Lin and Chu, and Dickey-Fuller, Im, Pesaran and Shin were used. In order to perform this analysis, Im, Pesaran and Shin test was used. The results of this test are presented in [Table 4].

Table 4: Im, Pesaran and Shin test

Research variables	tstatistic	Level of significance
Information disclosure level	-8.624	0.000
assets	-6.012	0.000
sale	-25.854	0.000
Financial leverage	-16.232	0.000
profitability	-13.118	0.000
Company age	-9.963	0.000
liquidity	-7.512	0.000

According to [Table 4], the level of significance is less than 0/05 and thus, all variables are stable in study period. Then a suitable method for analyzing data was identified.

Linearity test

In this study, SPSS statistical software was used to review the variance inflation factor and the linear independent variables. Each time the variance inflation factor is less than 10; there are no problems in terms of linearity between the independent variables. The linear research model results are presented in [Table 5].

Table 5: linear test results

		Standardized coefficients	t statistic	Level of significance	Co linearity statistics	
variables	constant	B	5.625	0.000	Tolerance	VIF
	assets	0.285	4.198	0.000	0.541	1.228
	sale	0.115	2.221	0.000	0.268	1.312
	Financial leverage	0.199	3.599	0.000	0.632	1.291
	profitability	0.168	3.068	0.000	0.417	1.331
	Company age	0.117	2.661	0.000	0.519	1.201
	liquidity	0.138	2.991	0.000	0.551	1.258

Testing research hypotheses

In order to estimate the coefficients of the model to test hypotheses, to determine the mixed data whether they are homogeneous or heterogeneous Chow test and F statistic were used. The results of these tests are presented in [Table 6].

Table 6: Chow test results

Chow test results	Level of significance	F statistic	Null hypothesis
Null hypothesis is rejected	0.000	7.312	Using panel data model

The results of

Chow test shows that F statistic is less than 0.05%. So to test this model, the data is used for panel. [Table 7] shows Hausmann test. This test checks the necessity of using fixed or random effects.

Table 7: Hausmann test results

Test result	Level of significance	Chi-square statistic	Null hypothesis
Null hypothesis is rejected	0.000	17.032	Using a random effect model

According to [Table 7] the level of significance of Hausmann test is less than 0.05. To estimate coefficients fixed effects model should be used. Test results using a fixed effects model and generalized least squares estimation methods are presented in [Table 8].

Table 8: Testing research hypotheses

variable	coefficient	Standard level	t statistic	Level of significance
constant	0.568	0.089	7.789	0.000
assets	0.329	0.079	3.398	0.024
sale	0.499	0.098	5.867	0.000
Financial leverage	0.257	0.066	2.678	0.038
profitability	0.388	0.063	4.036	0.000
Company age	0.231	0.091	2.112	0.043
liquidity	0.199	0.083	2.003	0.048
F statistic	134/105	The coefficient of determination		0.698
Significance level of F statistic	0.000	Adjusted coefficient of determination		0.691
EGLS method (fixing potential effects of heterogeneity of variance)	Durbin-Watson			2.231

According to the results of [Table 8] since the t-statistic of total assets variable is more than 1.965 and its significant level is less than 0.05, thus there is a significant relationship between the amount of total assets and information disclosure in listed companies of Stock Exchange of Tehran. So the first hypothesis is confirmed.

According to the results of [Table 8] since the t-statistic of total sale variable is more than 1.965 and its significant level is less than 0.05, thus there is a significant relationship between the amount of total sale and information disclosure in listed companies of Stock Exchange of Tehran. So the second hypothesis is confirmed.

According to the results of [Table 8] since the t-statistic of financial leverage variable is more than 1.965 and its significant level is less than 0.05, thus there is a significant relationship between financial leverage and information disclosure in listed companies of Stock Exchange of Tehran. So the third hypothesis is confirmed.

According to the results of [Table 8] since the t-statistic of profitability variable is more than 1.965 and its significant level is less than 0.05, thus there is a significant relationship between profitability and information disclosure in listed companies of Stock Exchange of Tehran. So the fourth hypothesis is confirmed.

According to the results of [Table 8] since the t-statistic of company age variable is more than 1.965 and its significant level is less than 0.05, thus there is a significant relationship between company age and information disclosure in listed companies of Stock Exchange of Tehran. So the fifth hypothesis is confirmed.

According to the results of [Table 8] since the t-statistic of liquidity variable is more than 1.965 and its significant level is less than 0.05, thus there is a significant relationship between liquidity and information disclosure in listed companies of Stock Exchange of Tehran. So the sixth hypothesis is confirmed.

CONCLUSION

Today transparent information is one of the principles of accountability and informed economic decisions. Disclosure of information by companies is one of the most important and valuable sources of information for investors, creditors, and other stakeholders. If sharing information in communities is higher, financial corruption will decrease. The ability to make informed decisions increases and the accountability of public and private sectors on how to produce and consume more resources increases too.

Companies disclose information through the publication of financial statements, explanatory notes, and report of public meetings. Furthermore, some companies in addition to the minimum information disclosure according to relevant standards and other rules and regulations, optionally disclose additional information. Information disclosure by companies is divided into two categories: mandatory and optional disclosure. One of the most important factors for sustainable development in the economy of any country is providing basic infrastructure to attract domestic and foreign investment. This is possible with a healthy competitive environment through transparent and timely information and access for all market participants to clear information. If the dissemination of information is done more and better in communities, ability to make informed decisions and take responsibility on how to obtain and use information will be more. One of the requirements of economic growth and development is that all stakeholders have access to transparent information. Users of financial information need accurate and timely information to make decisions related to investment. Companies that do not have acceptable and transparent financial reporting, face credit risk and lose shareholder confidence. Under such circumstances eventually, the credit and liquidity reduce severely in the capital market. In fact, the main condition for the long term growth of capital market is transparent information environment. Transparency and disclosure of information increase certainty. In this way the expected return is reduced and thus will lead the cost of capital. This way could help the company with growth, development, and continuous improvement. Researches confirm that increasing transparency of information and disclosure quality will lead companies to lower costs.

Today no one can ignore the importance of financial reporting, because shareholders and creditors make their important investment decisions based on companies' financial information. Appropriate disclosure and transparency of financial reporting can make certain circumstances and promote investors confidence. The importance of access to relevant information and relevant decision is to the extent that in democratic societies, transparency of information and access to it are among the investors rights. Demands for financial reporting and disclosure are because of information asymmetry and conflicts of interest between managers and external investors. Disclosure of information has an important role in reducing the conflicts. According to the privatization process in the country and increasing the number of investors and on the other hand legislation of securities market, focusing on investment and consequently the financial reporting are growing every day. Several factors affect the level of disclosure of companies' information but understanding the impact of these factors on disclosure level is a complicated process and is out of the investor's time and cost range. Many studies were done on the disclosure of information at the international level. These factors are in companies' financial statements and notes. The quality of accounting information disclosure can be considered a function of various factors. Therefore it is necessary to identify features of the company that makes presenting accounting information of high and low quality and it is necessary to identify features of the company that creates a relationship between disclosure quality with discretionary accruals as a measure of earnings management and conservatism.

Financial statements from the main part of the process of financial reporting. The purpose of financial statements is providing summarized and classified information about financial situation, financial operation, and financial flexibility of business unit. This purpose helps a wide range of users of financial statements with making economic decision. Disclosure of accounting policies used in the financial statements should be clear and explain any change in accounting policies. Identification, assessment, and disclosure of financial information can affect the image of financial market condition. Providing continuous information and optimal performance of business units caused using assume obligations of financial reporting inevitable. In the commitment accounting system, financial events are reported regardless of the time to get and payment at the time. The accounting profit consists of two components of cash flow and accruals. Accounting information should be able to reflect and predict future financial prospects of companies. Accounting information should be able to identify the potential financial impact in future, risks, and uncertainties. Disclosure of great importance can show uncertainties and the risks that effect on the financial condition of the companies. Therefore the following suggestions are offered:

It is recommended to stock exchange to force governance in listed companies in stock exchange to have more clear information. It is also recommended to improve the accounting system in order to send timely information.

Increased disclosure of information reduces cost of stock trading. By increasing the amount of disclosure

in annual reports, the stock market will be more transparent. Increased disclosure of information provides the ability to reduce the risks of uncertainty, the expected rate of shareholders, and the cost of capital. In other words, improving the quality of corporate disclosure reduces information asymmetry and thus leads to lower cost of capital.

Accounting information is useful for investment decisions and it increases the usefulness and quality of information disclosure. On the other hand corporate profits is an important factor in investors' decisions, investors and other users of financial statements can assess the reliability and confidence in corporate profits and can make correct decisions about purchase and sale of investments.

It is recommended to stock exchange to create incentives for early news disclosure or providing situations to stimulate managers to disclose bad news through upholding the normal market activities such as supporting financial analysts and investment institutions, training brokers and actual and potential investors. It is recommended to investors and others in the capital market to pay less attention to disclosure in their investment decisions in times of rising prices.

It is recommended that stock exchange has strict laws to prevent poor disclosure reports. These strict laws are requiring companies to present general comment of auditor towards the logic of forecasts, development of standards for disclosure, and etc. It is recommended to investors and others in the capital market to pay attention to optimistic reports at the time of deflation in their investment decisions.

Any research work is not without limitation, this research is also limited. In this study, only six factors were considered as factors affecting the disclosure of information. It is recommended in future research variables such as the complexity of companies, company life cycle, earnings of per share, and book value will be added to the research model. There are several ways to check the level of information disclosure that in this study the way listed on the stock exchange was used. Therefore, it is suggested to use other common methods and standards to check the level of information disclosure for future research. In this study, companies are not classified according to type of activity and classification could have changed the result of study. It is suggested that future research test the model according to the kind of industry. Family and non-family ownership are factors affecting the disclosure of information which were not mentioned in this study. It is suggested that type of ownership variable will be added to the research model.

CONFLICT OF INTEREST

There is no conflict of interest

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REFERENCES

- [1] Paananen M, Lin H. [2009] The Development of Accounting quality of IAS and IFRS over Time: the case of Germany, *Journal of International Accounting Research*, 8(1): 31-55.
- [2] Sletten E. [2012] The effect of stock price on discretionary disclosure. *Review of Accounting Studies*, 17(1):96-133.
- [3] Khajavi S ,AlizadeTalatape V. [2015] Effects of voluntary disclosure level on accrual-based earnings management based on real events. *Journal of Financial Accounting knowledge*, 2(3): 23-46.
- [4] Munoz F. [2013] Liquidity and firm investment: Evidence for Latin America, *Journal of Empirical Finance* 20:18-29.
- [5] Thanatawee Y. [2011] Life-cycle theory and free cash flow hypothesis: Evidence from dividend policy in Thailand. *Journal of Business*, 34:411-433.
- [6] Moradi, Eskandar H . [2014] Checking the quality of earnings over the life cycle in listed companies of Stock Exchange of Tehran, *Journal of Accounting*, 5(19): 121-139.
- [7] Behbahani M. [2015] The effect of structural features on the quality of voluntary disclosure in listed companies of Stock Exchange of Tehran. The first international conference on accounting, auditing, management and economics.
- [8] Cao C, T Simin Timothy , Wang Y. [2013] Do mutual fund managers time market liquidity, *Journal of Financial Markets* , 279-307.

ARTICLE

THE IMPACT OF SOCIAL RESPONSIBILITY ON FINANCIAL PERFORMANCE THROUGH COMPETITIVE ADVANTAGE AND REPUTATION (CASE STUDY: PRODUCTION COMPANIES LOCATED AT INDUSTRIAL TOWNS OF GILAN PROVINCE)

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ABSTRACT

The present research has been performed with the aim of investigating the impact of social responsibility on financial performance through competitive advantage and reputation in the production companies located at industrial towns of Gilan province. The statistical population of this research included production companies located at industrial towns of Gilan province and the sampling method in this research is available non-probable. The data collection method in this research is field survey and its tool is questionnaire. In order to prove the validity of questionnaire, the content validity method, and for determining the reliability, Cronbach's alpha coefficient were used. To test research hypotheses, structural equations modeling method was applied by using Warp PLS software. The results showed that social responsibility of production companies impacts on their financial performance. The competitive advantage impacts on the financial performance of production companies. Reputation impacts on the financial performance of production companies. Social responsibility impacts on the company's reputation. Social responsibility impacts on the competitive advantage. Company's reputation impacts on the competitive advantage. Company's social responsibility has significant relationship with the financial performance of companies through company's reputation. Company's social responsibility has significant relationship with the financial performance of companies through competitive advantage. Company's social responsibility has significant relationship with the financial performance of companies through reputation and competitive advantage.

INTRODUCTION

Nowadays the role of business units in the community has undergone many changes, in a way that it is expected that the business units not only think about increasing their profit, but they are also responsible towards the community and should be useful for the community interacting with. The business unit cannot escape from the community, and the community cannot exist without business unit either. Thus, there is a bilateral relationship between business units and the community. The company's social responsibility towards the community is useful both for the business unit itself and also for the community and better understanding of its potential benefits can result in high outputs of investment for the companies [1].

Performance assessment in decision making process is one of the most important issues in the financial economy domain; hence the function of financial and economic criteria for evaluating companies' performance is essential. In the competitive environments the managers by using performance measurement process should lead affairs accurately in the path of work progress and to the desired goals and strategy of organization consciously [2].

In an economic enterprise that the goal is to increase the owners' wealth, attention to increasing profit provides the causes of target realization. Actually, calculating the financial performance ratio means achieving organizational goals. Considering that the performance measurement criteria have already been variously classified in different texts, that each one of these classifications alone has basic disadvantages, so in the evaluation process a set of indicators should be the basis of work. Moreover, the investors and stakeholders need to be aware of various dimensions of companies' performance, particularly the financial dimensions of their performance. Continuous improvement of organizations' performance creates a great synergy power that this power can become the supporter of organizational development and growth plan. Without measuring and evaluating performance, the continuous improvement of performance will not be actualized, to the extent that Lord Kelvin, English physicist about the necessity of measurement says: "Whenever we could measure what we are talking about and say it in the figures and scores format, we can claim that we know something about the topic discussed. Otherwise our knowledge and awareness is incomplete and it will never reach maturity stage." [3].

In today's competitive world of the organizations, the social responsibility of organizations is the main factor of the survival of every organization. Social responsibility is an issue having special importance in new management, because the managers' disregarding social responsibility will prevent their effective service to the community and the development and credit of organization. Nowadays all managers should perform measures that are acceptable for the community and public to achieve the goals of organization [5].

The desire and urge of business unit to the commitment towards social responsibility in all dimensions has considerable impact on the financial performance. Actually the tendency towards social responsibility encourages the business unit to try for improving environment, use less energy and materials, and

KEY WORDS

Social Responsibility,
Financial Performance,
Competitive
Advantage, Reputation

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manage wastes and so on [1]. Thus, the business units can arbitrarily maximize their long term outputs through reducing their negative impacts on the community. So, the implementation of corporate social responsibility results in improving companies' success in long term, and ultimately results in economic growth and company's competitive ability increase, and its financial performance improvement [6]. Thus, the responsibility of company to the community is useful both for the business unit itself and for the community, and better understanding of its potential sources can result in high investment outputs for the companies [5]. The competitive space takes the organizations to the side that exploits various tools and methods for qualitative and quantitative development of their market. The organizations should find the ways to take distinguished strategy compared with others for offering services and producing products (Attaran et al., 2014).

Competitive advantage indicates a superior performance in specific business indicator. This superior performance gives a competitive advantage to the company that, when compared with competitor companies, can be observed as a positive difference in performance [2]

Scientists such as Porter (1991) observed that the main requirement of companies to succeed in a competitive advantage depends on human resources, which is unique and specific in the company. Seubert et al. (2001) concluded that sustainable competitive advantage is not rooted in physical assets and financial capitals, but it is in effective networking of unique intellectual assets [3].

Social responsibility of companies has also other benefits, among which increasing ability for hiring newcomer employees, and maintaining experienced employees and governmental support can be mentioned. The companies by progressing towards social responsibility comprehend the point that they can employ new forces more conveniently and maintain the experienced employees for an adequate period of time that are obligatory for the success of business unit. The social responsibility of companies has numerous stakeholders, that these stakeholders are regarded the same as shareholders for some companies. The meaning of stakeholders is actually the same as reconfiguration of shareholders' viewpoint that evaluates the stakeholders' measures with regard to the new path. Actually the social responsibility of companies is used for evaluating the performance of stakeholder groups. These groups include employees, customers, investors, community, natural environment and suppliers. The goal of present study is to assess the relationship of social responsibility with financial performance through competitive advantage and reputation in the production companies located at industrial towns of Gilan province. Regarding the points stated above, this question is formed in the researcher's mind that does the social responsibility have impact on financial performance of production companies through competitive advantage and reputation?

Research model

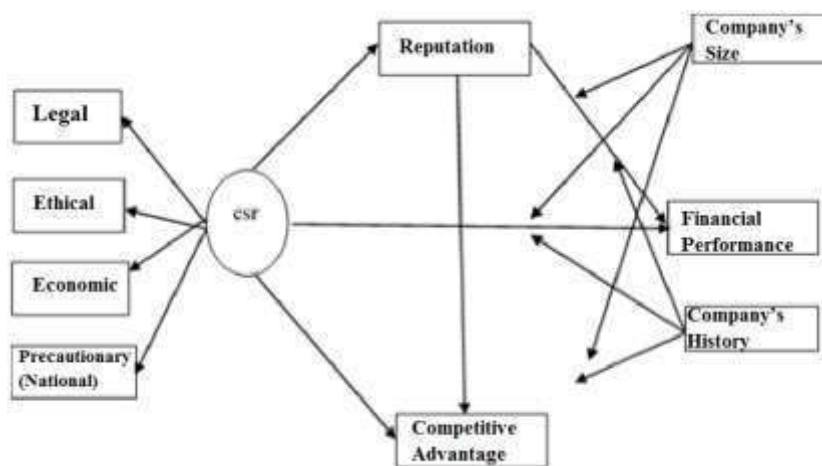


Fig. 1: Conceptual Model (Taken from Saiedi et al.,2015)

Research hypotheses

1. Social responsibility of production companies impacts on their financial performance.
2. Social responsibility and the performance of companies have significant relationship with the presence of mediating variables.
3. Competitive advantage impacts on the financial performance of production companies.
4. Companies' reputation impacts on the financial performance of production companies.
5. Companies' size and history adjust the relationship between social responsibility and the financial performance of production companies.

6. Company's reputation impacts on competitive advantage.

MATERIALS AND METHODS

Research methodology

This research is applied, since a theoretical structure among the actual and real contexts and situations will be investigated. Moreover, in this research the case study will be used. In this method, both statistical analyses and qualitative data analysis can be used. As the main goal in this research is to find the relationship among several variables that occur naturally and no empirical manipulation will be done, it is descriptive. This research that will also distribute and collect the main tool of data collection (questionnaire) among the population and samples is a survey. The tool of data collection of this research is questionnaire that its validity will be determined by the viewpoint of experts and professionals, and its reliability will be obtained by Cronbach's alpha. The statistical population in this research is the production companies located at industrial towns of Gilan province that for years maintained their growing process in all economic crises and conditions in the country and have already done necessary measures to perform the corporate social responsibility actively by creating the committee of social responsibility within their company, and have had also special attention in their decisions in this respect. In the research by the aid of the analysis of collected data, we search the research and scientific reality and questions.

In this research the structural equations modeling with Partial Least Squares (PLS) and Warp PLS software are used, and the analysis of data is performed based on data analysis algorithm in partial least squares method that includes two parts of "investigation of model fitness", and "research hypotheses test". The reason of this issue returns to the point that partial least squares method unlike first generation software of structural equations modeling such as LISREL or AMOS is not sensitive to the sample size and the normality distribution of variables. In the present research due to the existence of adjusting variables, the PLS method or partial least squares approach seems to be appropriate in data analysis.

Evaluation of the Reliability of Measurement Model

Table 1: Evaluation results of the reliability of research measurement model

Reliability Criteria	Competitive Advantage	Social Responsibility	Reputation	Financial Performance
Combined Reliability Coefficient	0.862	0.951	0.825	0.878
Cronbach's Alpha Coefficients	0.806	0.945	0.717	0.838

ring the above [Table 1], the combined Reliability coefficients and Cronbach of variables are higher than 0.7. The extracted variance mean is also at least 0.5, so the reliability of measurement tool is confirmed.

Table 2: Load factors for investigating convergent validity

Structure Value	Competitive Advantage	Social Responsibility	Reputation	Financial Performance	P value
C.ADV1	0.73	-0.079	0.238	0.345	<0.001
C.ADV2	0.669	0.252	0.284	0.205	<0.001
C.ADV3	0.78	0.105	0.01	0	<0.001
C.ADV4	0.582	0.298	0.284	0.025	<0.001
C.ADV5	0.736	0.219	0.061	0.01	<0.001
C.ADV6	0.775	0.474	0.123	0.183	<0.001
CSR1	0.268	0.758	0.206	0.018	0.05
CSR2	0.031	0.804	0.024	0.021	0.127
CSR3	0.115	0.676	0.15	0.287	0.073
CSR4	0.025	0.727	0.224	0.308	<0.001
CSR5	0.231	0.58	0.081	0.178	<0.001
CSR6	0.066	0.722	0.244	0.227	<0.001
CSR7	0.356	0.668	0.264	0.199	<0.001
CSR8	0.109	0.746	0.091	0.058	<0.001
CSR9	0.12	0.782	0.073	0.032	<0.001
CSR10	0.02	0.751	0.073	0.057	<0.001

CSR11	0.109	0.72	0.096	0.2	<0.001
CSR12	0.093	0.801	0.018	0.167	<0.001
CSR13	0.083	0.722	0.087	0.183	<0.001
CSR14	0.009	0.64	0.232	0.257	<0.001
CSR15	0.417	0.739	0.173	0.114	<0.001
CSR16	0.05	0.767	0.02	0.043	<0.001
CSR17	0.018	0.546	0.08	0.182	<0.001
CSR18	0.302	0.758	0.104	0.103	<0.001
Rept1	0.35	0.254	0.684	0.175	<0.001
Rept2	0.148	0.175	0.756	0.162	<0.001
Rept3	0.166	0.269	0.761	0.03	<0.001
Rept4	0.305	0.15	0.741	0.358	<0.001
F.P1	0.114	0.065	0.292	0.614	<0.001
F.P2	0.259	0.078	0.059	0.738	<0.001
F.P3	0.259	0.013	0.078	0.763	<0.001
F.P4	0.03	0.041	0.003	0.767	<0.001
F.P5	0.136	0.139	0.121	0.719	<0.001
F.P6	0.267	0.434	0.31	0.67	<0.001
F.P7	0.057	0.073	0.292	0.71	<0.001

The above [Table 2] shows that the factor loads of the indicators inside every structure have allocated more value to themselves than its outside structure that can indicate convergence validity among the indicators of each one of the research structures.

Research hypotheses test

For research hypotheses the modal is used as follows:

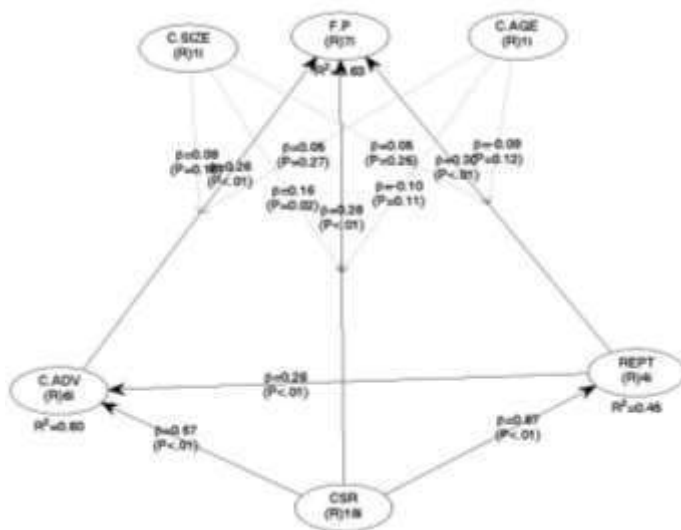


Fig. 2: Structural equations model (Final Output of Warp PLS Software)

In the mentioned model, the social responsibility is independent variable, the financial performance is dependent variable, and the variables of reputation and competitive advantage are mediating variables, and the company's history and size are adjusting variables.

DISCUSSION AND CONCLUSION

The results showed that the number of employees of companies under investigation (companies' size) was 26.3 percent less than 100 people, 52 percent, 100 to 300 people, and 18.4 percent more than 300 people.

It was observed that 12.5 percent of companies have less than 10 years, 38.2 percent has 10 to 20 years, and 44.1 percent has more than 20 years work experience.

It was observed that the mean of all research variables was more than the expected mean (3 scores), and is located in the range of [3.6464, 3.3299]. The highest and lowest mean among the research variables are also respectively related to reputation and financial performance variables.

It was observed in the first hypothesis that the social responsibility of production companies impacts on their financial performance. The impact ratio of the social responsibility of production companies on financial performance is also equal to 0.28.

It was observed in the second hypothesis that the competitive advantage impacts on the financial performance of production companies. The impact ratio of the competitive advantage on the financial performance of production companies is also equal to 0.26.

It was observed in the third hypothesis that the reputation impacts on the financial performance of production companies. The impact ratio of the reputation on the financial performance of production companies is also equal to 0.30.

It was observed in the fourth hypothesis that the social responsibility impacts on the company's reputation. The impact ratio of social responsibility on company's reputation is also equal to 0.67.

It was observed in the fifth hypothesis that the social responsibility impacts on the competitive advantage. The impact ratio of the social responsibility on competitive advantage is also equal to 0.57.

It was observed in the sixth hypothesis that the company's reputation impacts on the competitive advantage. The impact ratio of the company's reputation on competitive advantage is also equal to 0.26.

It was observed in the seventh hypothesis that the company's social responsibility impacts through company's reputation with companies' financial performance. The impact ratio of the company's social responsibility through company's reputation with financial performance is also equal to 0.201.

It was observed in the eighth hypothesis that the company's social responsibility impacts through competitive advantage with companies' financial performance. The impact ratio of the company's social responsibility through competitive advantage with financial performance is also equal to 0.148.

It was observed in the ninth hypothesis that the company's social responsibility impacts through reputation and competitive advantage with companies' financial performance. The impact ratio of the company's social responsibility through reputation and competitive advantage with financial performance is also equal to 0.045.

With regard to the results obtained from investigating the impact of adjusting variables, it is observed that all beta coefficients resulted from the impact of adjusting variable in the model are insignificant ($P > 0.05$). The only mode that the obtained beta is significant is the impact of company's size on direct relationship between social responsibility and financial performance that the beta ratio is equal to 0.16. The positive sign of beta indicates that considering social responsibility in larger companies will cause financial performance improvement.

Table 3: Summary of research results

No.	Hypothesis	Coefficient	Results
1	Social responsibility of production companies impacts on their financial performance.	0.28	Confirmed
2	Competitive advantage impacts on the financial performance of production companies.	0.26	Confirmed
3	Reputation impacts on the financial performance of production companies.	0.3	Confirmed
4	Social responsibility impacts on the company's reputation.	0.67	Confirmed
5	Social responsibility impacts on the competitive advantage.	0.57	Confirmed
6	Company's reputation impacts on the competitive advantage	0.26	Confirmed
7	Company's social responsibility impacts through company's reputation with companies' financial performance.	0.201	Confirmed
8	Company's social responsibility impacts through competitive advantage with companies' financial performance.	0.148	Confirmed
9	Company's social responsibility impacts through reputation and competitive advantage with companies' financial performance.	0.045	Confirmed

Suggestions in Respect of Hypotheses Results

- ✓ It is suggested that the companies to create competitive advantage use branding strategies. The companies' reputation is among the effective factors in forming their brand equity. So, identifying the factors impacting on company's reputation is very useful and can bring more loyal customers for the company and be considerable help for company's profitability.
- ✓ It is suggested that with regard to the high priority of customer's satisfaction and trust and reputation, the contexts of increasing customer's satisfaction and trust, and reputation are provided. Among considerable points in this regard is accuracy in television and media advertisements. Another point in increasing customer's satisfaction and maintaining customers' trust is not delaying in service offering that can create high satisfaction, reliability, and trust. For every company, after employees, there is not any capital higher than customer's satisfaction and trust. To increase the customer's satisfaction and trust, the ethical and social techniques particularly performing social responsibility can be exploited, and recognizing

requirement in appropriate context and time can have wonderful impact on satisfaction, reliability, trust, reputation, identity, and even the brand of company, and creating competitive advantage.

Research limitations

- The research being cross-sectional makes the research results low reliable in future,
- Assessing financial performance variable qualitatively,
- The possibility of the existence of other mediatory variables such as customer's satisfaction that exists in the offered model.

Future suggestions

It is suggested for future researches to use qualitative indicators for measuring social responsibility such as environmental and etc. indicators as the substitution of social performance indicator. Since this research has focused only on the production companies located at industrial towns of Gilan province, it can be performed in other provinces and in other industries. Moreover, it is recommended that future studies are performed about the issue process in other developing countries, because the results might be increasable for other countries. Their results can be compared in various industries and countries.

CONFLICT OF INTEREST

There is no conflict of interest

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None

REFERENCES

- [1] Sandhu HS, Kapoor S. [2010] Corporate social responsibility initiatives: An analysis of voluntary corporate disclosure. *South Asian Journal of Management*, 17 (2): 47-80.
- [2] Areias JS , Eiriz, V. [2013] Building competitive advantage through inter-organizational projects. *STRATEGIC DIRECTION*, 29(9): 31-34. doi: 10.1108/sd-08-2013-0057.
- [3] Kashanipour M, Saghlinejad A, Farahi M. [2014] Performance Evaluation of Province Telecommunication Companies after Privatization with Emphasize on Comparing Performance Evaluation Methods, Third Conference on New Management Sciences.
- [4] Kamukama N , Ahiauzu A , Ntayi JM. [2011] Competitive advantage: mediator of intellectual capital and performance. *Journal of Intellectual Capital*, 12(1):152-164. doi: 10.1108/14691931111097953.
- [5] Kashanipour M, Saghlinejad A, Farahi M. [2014] Performance Evaluation of Province Telecommunication Companies after Privatization with Emphasize on Comparing Performance Evaluation Methods, Third Conference on New Management Sciences.
- [6] Amiri Z. [2008] Social Responsibility of Organizations and the Importance of Considering it, *Managers Convention*, 33:73-75.
- [7] Sanchez, Fernandez, Jose Luis, Luna Sotorrio L, BaraibarDiez E. [2010] The relationship between corporate governance and corporate social behavior: A structural equation model analysis. *Journal of Corporate Social Responsibility and Environmental Management*, 18 (2):91-101.

ARTICLE

EXPLANATION OF NARCISSISM, ORGANIZATIONAL IDENTITY, JOB BURNOUT AND ORGANIZATIONAL JUSTICE BY THE USE OF STRUCTURAL EQUATION METHOD (CASE STUDY: STAFF OF WORKERS' REFAH BANKS IN PROVINCES OF SOUTHERN AND NORTHERN KHORASAN)

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ABSTRACT

Background: The present research aims to study the relationship between narcissism, organizational identity, job burnout and organizational justice. This research's statistical population includes 200 persons of Staff of workers' Refah Banks in provinces of Southern and Northern Khorasan. **Methods:** The present research's method is simple random and sample size is equal to 140 according to Cochran formula. The questionnaires including Narcissism with Cronbach's alpha coefficient (0.87), organizational identity with Cronbach's alpha coefficient (0.88), job burnout with Cronbach's alpha coefficient (0.78) and organizational justice with alpha Cronbach coefficient (0.80) have been used in this research and all the questions are as 5-option LIKERT spectrum. Structural relationship model was used in order to analyze data all whose questions are as five-option LIKERT spectrum. Structural relations model were used in this research in order to analyze data. Statistical software LIZREL was used for data analysis and hypotheses testing fulfillment and other this research's analyses.

Results: The results totally showed that there is no significant relationship between job burnout and organizational justice, but other research's hypotheses were confirmed.

INTRODUCTION

KEY WORDS
Narcissism,
Organizational identity,
Job burnout,
Organizational justice
and Structural equation

The need for a valuable generation of staff has been cleared through completely transformed conditions governing organizations, competition increase and necessity for their efficacy in such situation. Therefore, special attention to staff's psychological status is not a new subject. Accordingly, justice has been always considered as a fundamental need for human's social life during history. Injustice and unfair distribution of organization's achievements and outcomes lead to weakness of staff' spirit and reduce spirit of effort and activity in them. So, observing justice is the secret of survival and sustainability of organization and its staff's development and progress process [1]. On the other hand, those who have a sense of injustice are more likely to leave the organization and they are suffered from ambiguity and role conflict [2]. They may begin to have abnormal behavior such as vindictiveness. As ones of outcomes of lack of justice include refuse to make effort, negligence and poor behavior at workplace and in its acute form, resignation from work. It is important to point out that job burnout in staff leads to negative attitudes and unusual behaviors, character defamation negative effects of spiritual burnouts and loss of incentives in their performance in order to perform duties. So, understanding this issue that how the people judge in their organization regarding justice and how the response to perceived justice or injustice are ones of the fundamental topics especially for understanding organizational behavior. Because job burnout leads to decrease in offered services to customers and clients and it followed by dissatisfaction with the service, so identification and prevention of job burnout will have remarkable role in promoting individual's mental health and increase in level of offered service quality [3]. Maslash et al in 1976, Boorish in 2002, Almer in 2002, Philian in 2001, BadriGargari in 2005 and Zare in 2003 in their researches showed that there are some factors which can influence job burnout. On the other hand, the other one of research areas in organizational leadership is an event named narcissism of organizational leaders. Generally, narcissistic people have a very high positive self-concept and a strong self-esteem and they consider themselves unique [4]. Also such persons focus on themselves rather than others and so they do not have empathy, agreement and relationship. Narcissistic people use some intra-personal mechanisms and inter-personal strategies in order to adjust their movement [5]. Srakiss in 1990 believes that inter-personal relationships created by narcissistic immature commands will be specified by exploitation, disturbance and lack of trust in others [6]. Totally, several negative consequences have been enumerated for narcissism in organization such as lack of other managers and staff's progress, possibility of misusing of others and immoral behaviors, disregard for external reality and organization's environmental threads and destroying trust and organizational relationship [7]. According to organizational identity theory, providing collaborative behavior outside the role by staff depends to the extent in which organization's members consider organization and themselves the same and they also imagine their identity in that organization [8]. This kind of identity is considered as a subset of social identity in which people are identified according to membership or attachment to a certain organization [9]. Theoretically, organizational identity can be related to many variables such as performance, loyalty to organization and partnership behavior [10]. Organizational identity is identified as useful framework which helps to understand the concept of having the same family. Organizational identity helps each person in order to distinguish her from the other member of family [11]. The studies reveal that the personnel who identify themselves with their organization, they will have higher commitment toward organization and they also have less tendency to leave jib and

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organization [12]. Therefore, respecting conducted studies, the present research aims to study relationship between some variables such as narcissism, organizational identity, job burnout and organizational justice.

RESEARCH'S LITRATURE

Narcissism

Narcissism is rooted in Greek word "Narcissus". Today, narcissism has attracted much attention of many researchers to itself as a personality feature which has been studied in social, characteristic and clinical psychology [13, 14]. American Psychiatric Association defines narcissism as a personality disorder including self-centered being, attract others' attention and focus it on him through praising them. Narcissism's results as a disorder in manager's performance will be cleared as shortage in identity. One of the sign of this shortage can be manager's extra referring to others in order to show his self-esteem and respect or determining objective according to obtaining others' confirmation [15]. Although having a high level of narcissism is necessary for human's performance, but an increase in it especially regarding managers can usually have offensive and harmful meanings for manager and organization. Shoat believes that existence of much narcissism is appeared through interference if companies' executive managers in misleading and unethical financial reports that they can lead to collapse of large companies [16]. Generally, several negative results have been enumerated for narcissism at organization such as lack of other managers and personnel's progress ,possibility of misusing of others and unethical behaviors, disregarding external realities and environmental threats of organization and destroying trust and organizational relationship [7].

Narcissism has been defined as a personality disorder in general clinical psychology and psychiatry. Narcissism is an inflexible and fixed characteristic in this definition which includes exaggeration and arrogance and desire of being praised [17].

Narcissism is relatively sustainable personal differences including zooming out, self-love, pride and self-highlighting [18]. Since narcissism is a personality variable related to tendency toward unlimited success and power, so it is not surprising that most of the narcissistic people seek managerial opportunities in order to satisfy their need to power and fame [19]. They follow more power compared with others and it is more possible that they will receive to higher organizational level [20]. Of course, according to narcissism's modern concept, its non-adaptive and maladaptive aspect is not emphasized today, but also adaptive aspect and person's positive stimulant is focused [21,22]. Researchers state that adaptive narcissism has relationship with psychological welfare [23,22], job satisfaction [24], optimism [25], empathy and interpersonal relationship ,and solving social problem [27], and on the other hand maladaptive narcissism has relationship with social maladaptive [28], low self-esteem [29]. Narcissistic managers are motivated by being praised. Such managers sometime insist on their wrong decision and spend a lot of time and cost because of it which caused some difficulties for organization. Narcissism in managers can have some effects on organizational results and this applies through influencing managers' election in some fields such as strategy, structure and recruitment. Therefore, narcissism, as compared with other personality attributes, force managers to do some action which are out of norm and they seek attention-attraction and being praised and these actions will finally influence organization's performance [30].

Organizational identity

Discussion of individual, organizational and social identity is one of the main issues in the area of person's self-perception. Organizational identity is an underlying structure in organizational events and it has been made to hidden factor of many organizational behaviors. So, it has attracted increasing attention in management researches [31]. Experts believe that organizational identity includes self-perception at organizational atmosphere, therefore the sellers who are active in moral work atmosphere and they have accepted organization's ethical values, they have more been identified with organization and they have less tendency for leaving service. There is still little consensus regarding meaning and definition of organization identity. Organizational identity includes that category of organizational features which describes organization's past, present and future from the opinion of organization's members [32]. Fundamental assumption is this that every existence owns an objective which has defined that existence and reveals its reality. So, organizational identity can be defined as an element which expresses main coordinates [33]. Organizational identity encompasses that category of organizational features which organization's members feel as organization's main features and describe organization's features uniquely and they enjoy relative stability during time. In the other word, when we look at organization's past, present and future, we understand that the category of organization which are considered as the most central, stable and distinctive features constitute organization's identity [32]. Organizational identity has been also settled as a concept which exists in common understanding of organization's members from central characteristics and relatively sustainable of organization and it forms a inter-subjective thinking among personnel [34]. Organizational identity plays a central role in adjusting behavioral norms of organization's members. Managers have applied symbolic mechanisms in order to promote and establish a distinctive identity and this distinctive and prominent identity creates self-adjustment for people to achieve functional objectives, attract and maintain talents, reputation and creating mental security in organization and help people in facing with ambiguous situations [35]. Some researchers believe the event of personnel's leaving job is a behavioral approach and since person's view or tendency has been a determinant factor of

selection and person's conducts is subordinate of person's tendency to performing that behavior, so there is high correlation between desires of leaving service and leaving service[36]. Through studying effective factors on sellers' leaving service, researchers also perceived that high desire of leaving service has been the main determinant factor of leaving service among sellers and some factors such as organization's moral atmosphere and organizational identity can adjust this tendency [12].

Job burnout

Job burnout (burnout due to work) is continuous reaction to chronic emotional and interpersonal stressor drivers at work which is defined by the help of three dimensions including emotional burnout, depersonalization and absence of personal success (sense of insufficiency)[37].and it creates a chronic pressure which is due to inconsistency or lack of homogeneity between workers and jobs. Job burnout syndrome consists of three components that are considered today by researchers and psychologists. This syndrome's components includes physical burnout (tiredness and absence of power), emotional burnout (depression of feelings related to inability) and attitude burnout or self-depersonalization. Today, a remarkable percentage of staff and personnel suffer from this problem and it has attracted attention of organizations' managers because of decreasing their working power and consequently lower efficiency. The life outside of work and family life are also faced with disorder through this problem. Consequences of job burnout include decrease in efficacy, job dissatisfaction, decrease in public health and reduce in resistance and tolerance level. Farber believes that job burnout is a state of physical, emotional and spiritual tiredness which is created as a result of people's long-term and direct exposure with conditions that are emotionally overwhelming [38]. Dick expresses that job burnout consists of extreme burnout and feelings of being misused and this kind of tiredness will not be settled by rest and recess. He also believes that jib burnout is a state in which person imagines that he is lower than others regarding personality and he feel that his action and work are not considered [39].

Molach& Jackson in 1982 offered a comprehensive definition of job burnout. These two researchers know job burnout as a psychological syndrome which is a combination of three components including emotional analysis, depersonalization, and personal accomplishment reduction that occurred among those who work together in different levels[40]. Job burnout is not just an issue arisen from mere weakness and failure in staff, but also it is related to workplace and disconformity between individual's innate features and their job's nature. However disconformity is more, so potential of job burnout will be increased [41], and it will lead to decrease importance of values, weakening the wills and spirit [42]. Job burnout is not only related to person's mental health, but also it is related to level of his exploitation. So, making familiar with effective confronting methods with mental pressures and overcoming job burnout can help mental health promotion and increase in efficacy and efficiency of manpower [43].

Organizational justice

Justice is highest human value and it is a precious jewel in realization of human right. Justice is considered as one of the main beautiful and the most sacred words of human civilization and it is one of the concepts which is considered good by collective wisdom of all the people and its realization is base of governments' legitimacy and necessity [44]. Justice is one of the vital factors in any social partnership. Continuity of voluntary presence of individual in groups depends on the way of their understanding of method and extent of observing equity and justice. If members of a social group or system have justice understanding of that system's behavior, they will have more commitment for participation and preserving its development [45].

Research regarding organizational justice has a long history and experts have proposed different classifications of it. Research on justice was started by work of Adams in 1963 on equity theory.

Adams in this works emphasized perceived justice of consequences which is distributive justice [46]. Then, researchers paid attention toward perceived equality of budget allocation decisions to a section. The result of equality theory was distributive justice which included resources allocation or distribution. The next researchers showed that people will accept a certain extent of inequality if they understand that the procedures on which distribution decisions have been taken, have been justice. Procedural justice is created for this phenomenon description [47]. In addition to distributive and procedural justice, the third form of justice states that quality if inter-personal behavior is as a main contributor in order to understand equality during adoption of organizational processes and distributing organizational results [48]. This dimension of organizational justice has been named as interactional justice that is separated from procedural and distributive justice [49].Recently, a new dimension of organizational justice has been offered by Cropanzano, Goldman & Greenberg (2003), Folger, Cropanzano& Goldman (2012) entitled "Deontic justice" that is defined such this: It is a form of organizational justice which is based on correct and appropriate moral method and action of person and organization and it also shows the person and organization's attachment to moral values.

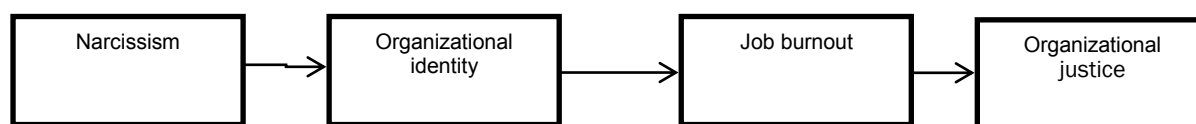


Fig. 1: Conceptual model

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Research's hypotheses

- 1- There is significant relationship between narcissism and organizational identity.
- 2- There is significant relationship between organizational identity and job burnout.
- 3- There is significant relationship between organizational identity and Organizational justice.
- 4- There is significant relationship between job burnout and Organizational justice.

MATERIALS AND METHODS

The present research's aim is to study relationship between some variables such as narcissism, organizational identity, job burnout and organizational justice. Statistical population in this research includes 220 staff of Workers' Refah Banks in Southern and Northern Khorasan province. The present research's sampling method is simple random and sample size is equal to 140 according to Cochran formula. Data required for present research has been collected from a questionnaire whose validity was tested. Researcher has used a questionnaire including 32 questions all of which were as five-option LIKERT spectrum in order to collect data. This data has been analyzed by software LISREL. The questionnaires including Narcissism with Cronbach's alpha coefficient (0.87), organizational identity with Cronbach's alpha coefficient (0.88), job burnout with Cronbach's alpha coefficient (0.78) and organizational justice with alpha Cronbach coefficient (0.80) have been used in this research and all the questions are as 5-option LIKERT spectrum. Measurement model has been obtained in present research following drawing research's analytical model based on data by the use of program Path Diagram through implementing program PERLIS from software LISREL that hypotheses have been tested in this research by using B coefficients and t test. In addition, model's fitness indexes have also been separately computed by implementing program PERLIS for considered model.

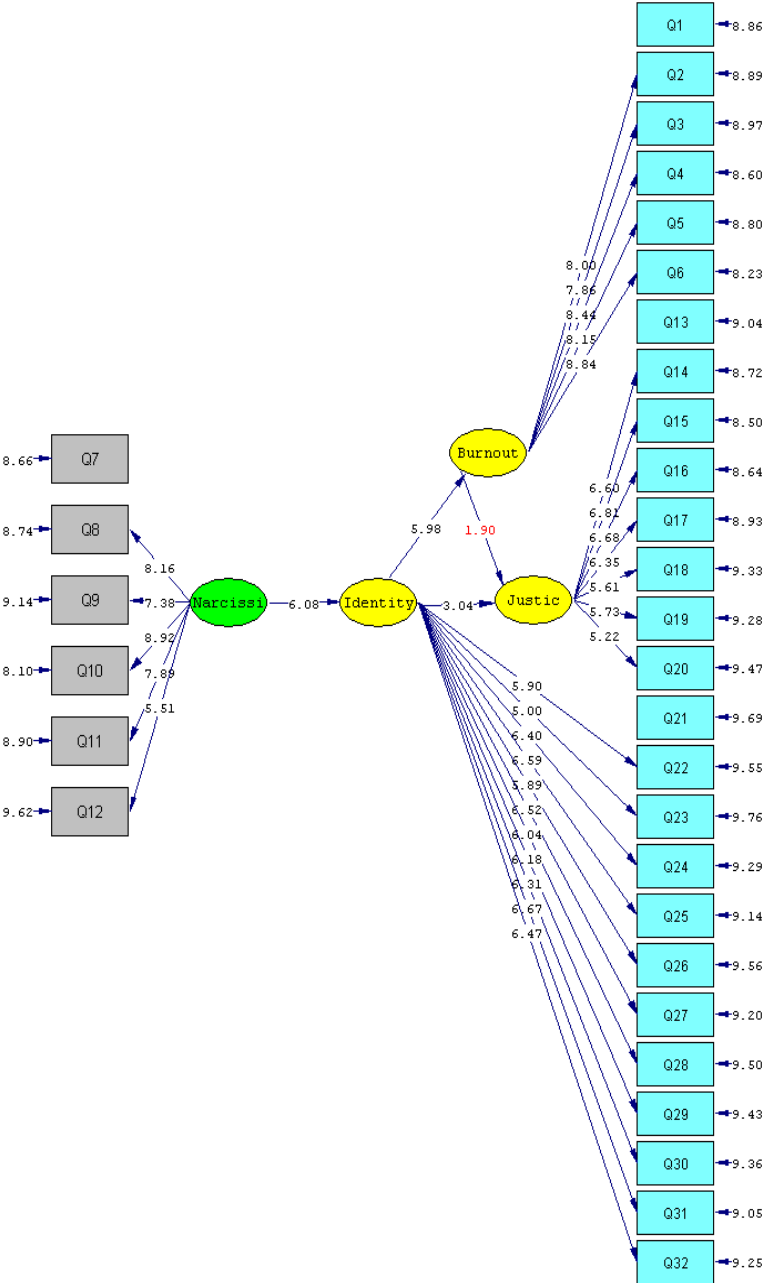
Table 1: Fitness indicators of research's model

Computed values	Standard values	Fitness index
460	-----	Degree of freedom,
998.44	It is not a suitable criteria because of dependency to sample size	Chi-Square
0.077	0.05	RMSEA
0.91	0.90	NFI
0.95	0.90	NNFI
0.95	0.90	CFI
0.061	0.05	RMR
0.76	0.90	GFI
0.73	0.90	AGFI

As it is observed in [Table 1], indexes of the compliance or goodness of fitness are placed at a relatively acceptable level.

Structural model test

In this research, confirmative factorial analysis method was used in order to test measurement model and route analysis to confirm research structural model test. Two below diagrams show overall model's output of software LISREL which simultaneously includes both structural and measurement model and in continue, we will separate and study them in detail.



Chi-Square=998.44, df=460, P-value=0.00000, RMSEA=0.077

Fig. 2: Base model with T value

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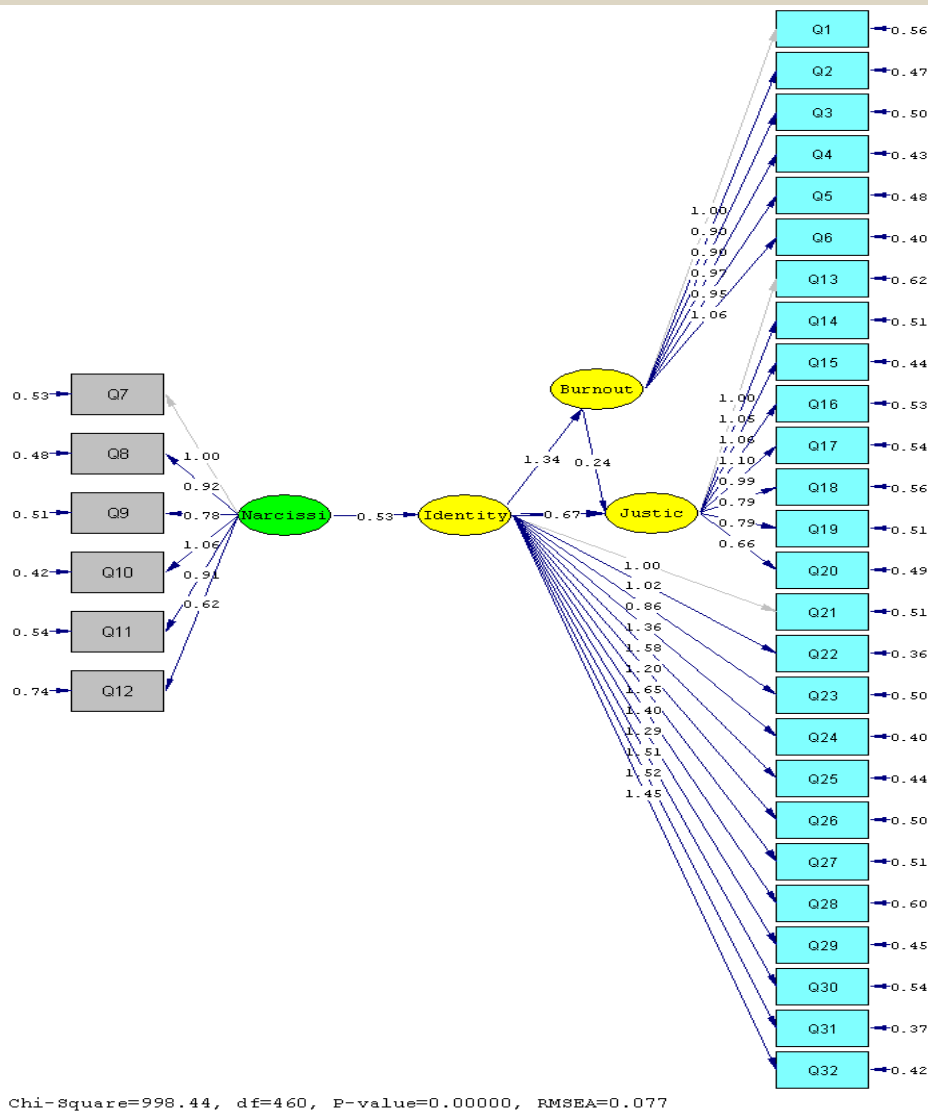


Fig. 3: Base model with rout coefficient

At structural model, Beta coefficients which show the level of solidarity between hidden variables have been appeared in diagrams that connect hidden variables together.

RESULTS

The first hypothesis

There is significant relationship between narcissism and organizational identity.

Table 2: the results of first hypothesis's test

Hypothesis	coefficient	Statistic t	result
1-There is significant relationship between narcissism and organizational identity.	0.53	6.08	accepted

According to the results in [Table 2], the effect of independent variable on dependent one has been supported by data and the path which connects these two variables is positive and significant (it is

significant at the 5 percent of error) ($t=6.08$ $\beta_{22}=0.53$). So with 95 % of confidence, we can say that there is significant relationship between narcissism and organizational identity.

The second hypothesis

There is significant relationship between organizational identity and job burnout.

Table 3: the results of second hypothesis's test

Hypothesis	coefficient	Statistic t	result
1- There is significant relationship between organizational identity and job burnout.	1.34	5.98	accepted

According to the results in [Table 3], the effect of independent variable on dependent one has been supported by data and the path which connects these two variables is positive and significant (it is significant at the 5 percent of error) ($t=5.98$ $\beta_{22}=1.34$). So with 95 % of confidence, we can say that there is significant relationship between organizational identity and job burnout.

The third hypothesis

There is significant relationship between organizational identity and organizational justice.

Table 4: the results of third hypothesis's test

Hypothesis	coefficient	Statistic t	result
1- There is significant relationship between organizational identity and organizational justice	0.67	3.04	accepted

According to the results in [Table 4], the effect of independent variable on dependent one has been supported by data and the path which connects these two variables is positive and significant (it is significant at the 5 percent of error) ($t=3.04$ $\beta_{22}=0.67$). So with 95 % of confidence, we can say that there is significant relationship between organizational identity and organizational justice.

The fourth hypothesis

There is significant relationship between job burnout and organizational justice.

Table 5: the results of fourth hypothesis's test

Hypothesis	coefficient	Statistic t	result
1- There is significant relationship between job burnout and organizational justice.	0.24	1.90	rejected

According to the results in [Table 5], the effect of independent variable on dependent one has not been supported by data and the path which connects these two variables is not positive and significant (it is significant at the 5 percent of error) ($t=2.81$ $\beta_{22}=0.29$). So with 95 % of confidence, we can say that there is not significant relationship between job burnout and organizational justice.

CONCLUSION

The first hypothesis' results showed that the amount of route coefficient among narcissism and organizational identity is equal to 0.53 and the amount of relative t is $6.08 > 1.96$ and according to t test, null hypothesis can be rejected with crisis value of 0.05 at the 95 percent of confidence. Therefore, researcher's first claim has been confirmed and we can say that there is a significant relationship between narcissism and organizational identity with 95 percent level of confidence.

The second hypothesis' results showed that the amount of route coefficient among organizational identity and job burnout is equal to 1.34 and the amount of relative t is $5.98 > 1.96$ and according to t test, null hypothesis can be rejected with crisis value of 0.05 at the 95 percent of confidence. Therefore, researcher's first claim has been confirmed and we can say that there is a significant relationship between organizational identity and job burnout with 95 percent level of confidence.

The third hypothesis' results showed that the amount of route coefficient among organizational identity and organizational justice is equal to 0.67 and the amount of relative t is $3.04 > 1.96$ and according to t test, null hypothesis can be rejected with crisis value of 0.05 at the 95 percent of confidence. Therefore, researcher's first claim has been confirmed and we can say that there is a significant relationship between organizational identity and organizational justice with 95 percent level of confidence.

The fourth hypothesis' results showed that the amount of route coefficient among job burnout and organizational justice is equal to 0.24 and the amount of relative t is $1.90 < 1.96$ and according to t test, null hypothesis can be rejected with crisis value of 0.05 at the 95 percent of confidence. Therefore, researcher's first claim has not been confirmed and we can say that there is not a significant relationship between job burnout and organizational justice with 95 percent level of confidence.

CONFLICT OF INTEREST

There is no conflict of interest.

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FINANCIAL DISCLOSURE

None

REFERENCES

- [1] Alvani Mehdi, Ezzatollah Poor Ezzat. [2003] social justice, sustainable development foundation, management perfection, management faculty, martyr Beheshti University, 2-3.
- [2] Boss K V. [2001] Fundamental research by means of laboratory experiments is essential for a better understanding of organizational justice. *Journal of Vocational Behavior*, 58:254-259.
- [3] Sherman DW. [2004] Nurses' stress & job burnout, How to care for yourself when caring for patients and their families experiencing life-threatening illness, *AM Nurse* ,104: 48-56.
- [4] Rose, P. [2002] the happy and unhappy faces of narcissism, *Personality and individual differences*, 33:379-392.
- [5] Zeigler-Hill, V, Myers, E M & Clark, C B. [2010] Narcissism and self-esteem reactivity: the role of negative achievement events. *Journal of Research in Personality*, 44: 285-292.
- [6] Svrakic DM. [1990] the functional dynamics of the narcissistic personality. *American Journal of Psychotherapy*, 44: 189-203.
- [7] Rosenthal, S A & Pittinsky, T L. [2006] Narcissistic leadership, *the leadership quarterly*, 17: 617-633
- [8] Ashforth B, Mael F. [1989] Social identity theory and the organization. *Academy of Management Review*, 14: 20-39.
- [9] Payne, M Jeremy. [2007] *The Bonds of Identification Revisited: Exploring the Impact of Organizational Identification in non-for-profit Organization*. Dissertation Submitted to the College of Vanderbilt University in Partial Fulfillment of the requirement for Degree of doctor of Education.
- [10] Joshi, Mahendra. [2008] *Organizational identity and top executives' information seeking behavior*, A dissertation submitted in partial fulfillment of the requirements for the degree of sctor of philosophy in business administration, University of Delhi.
- [11] Boers B. & Nordqvist, M. [2012] Understanding Hybrid-Identity Organizations: The Case of Publicly Listed Family Businesses, *International Studies in Entrepreneurship*, 15: 251-269.
- [12] DeConinck J. [2011] The effects of ethical climate on organizational identification, supervisory trust, and turnover among salespeople. *Journal of Business Research* ,64:617-24.
- [13] Brown RP, Zeigler-Hill, V. [2004] Narcissism and the non-equivalence of self-esteem measures: A matter of dominance? *Journal of Research in Personality*, 38: 585-592
- [14] Holtzman, N, Strube MJ. [2010] Narcissism and attractiveness. *Journal of Research in Personality and Individual Differences*, 47:577-528
- [15] Sosik John, Chun, Jae Uk, Zhu, Weichun. [2013] Hang on to Your Ego: The Moderating Role of Leader Narcissism on Relationships between Leader Charisma and Follower Psychological Empowerment and Moral Identity, *Journal of business ethics*, 1- 16.
- [16] Craig Ruse, America Joel. [2011] Detecting linguistic traces of destructive narcissism at-a-distance in a CEO's letter to shareholders. *Journal of business ethics*, 101:563-575.
- [17] Rijssenbilt, A. [2011] CEO narcissism: Measurement and Impact: Erasmus Research Institute of Management (ERIM).
- [18] Miller JD, Campbell W K. [2008] compare clinical and social-personality conceptualizations of narcissism, *Journal of Personality*, 76:449-476.
- [19] Rapier ML. [2005] An Interview Study Of Narcissistic Executives: Piercing The Corporate Veil of Narcissism in the Workplace, Say brooks Graduate School and Research Center, Yayınlanmış Doctoral Tezi.18-40.
- [20] Blair CA, Hoffman BJ, Holland KR. [2008] Narcissism in organizations: a multisource appraisal reflects different perspectives. *Human Performance*, 21:254-276.
- [21] Strelan P. [2007] Who forgives other, themselves, and situations, the roles of narcissism, guilt, self-esteem, and agreeableness, *Personality and Individual Differences*, 42: 259-269
- [22] Carlson KS, Gjerd PF. [2009] Preschool personality antecedents of narcissism in adolescence and young adulthood: A20- year longitudinal study, *Journal of research in personality*, 43:570-578.
- [23] Gale CR, Booth T, Möttus R, Kuh D, Deary IJ. [2013] Neuroticism and Extraversion in youth predict mental wellbeing and life satisfaction 40 years later. *Journal of Research in Personality*, 47(6): 687-697.
- [24] Mathieu C. [2013] Personality and job satisfaction: The role of narcissism. *Personality and Individual Differences*, 55(6): 650-654.
- [25] Lapsely Dk, Aalsma MC. [2006] an empirical typology of narcissism and mental health in late adolescence, *Journal of adolescence*, 29:53-71.
- [26] Besharat Mohammad Ali &Khoda Bakhsh Mohammad Reza &FarahaniHojjatollah& Reza zadeh Syed Mohammad Reza. [2011] intermediation role of narcissism in relationship between empathy and quality of inter-personal relations, *quarterly of practical psychology*, 5th year, 1(17):7-23
- [27] Abol-Qasemi Abbas & Kiamarsi Azar. [2008] evaluating relationship between solving social problem and its components with narcissistic and antisocial personality patterns in high school students in Ardebil, *psychological studies*, Period 4(4): 9-26
- [28] Barry C T, Pickard J D, Ansel L L. [2009] the associations of adolescent invulnerability and narcissism with problem behaviors, *Journal of personality and individual differences*, 47(6): 577-582.
- [29] Cramer P, Jones CJ. [2008] Narcissism, identifications and longitudinal change in psychological health: dynamic predictions, *Journal of research in personality*, 42:1148-1159.
- [30] Chatterjee A, Hambrick D. [2007] Narcissistic chief Executive officers and their effects on company strategy and performance, *Administrative science quarterly*, 52:351-386.

- [31] NavvabiArmaghan. [2011] analyzing the relationship between the methods of organizational sociability and organizational identity at Esfahan's municipality, Master's thesis, Esfahan university, Administrative and economic sciences faculty
- [32] Puusa A. [2006] Conducting Research on Organizational Identity, *Electronic Journal of Business Ethics and Organization Studies*, 11(2):123-35.
- [33] Wei H, MT BJ. [2007] Identity studies: multiple perspectives and implications for corporate-level marketing. *European Journal of Marketing*, 41(7):8-19.
- [34] Whitten DA, Mackey A. [2002] A Social Actor Conception of Organizational Identity and Its Implications for the Study of Organizational Reputation, *Business & Society*, 41:393-414.
- [35] Rahman Seresht Hussein & Mohsen FarhadiNejaad, [2002] a review on relationship between organizational identity and commitment, *two monthly of human resources* 2(11):12-29.
- [36] Tanami Mohammad Mahdi, [1997] tendency toward leaving military service and leaving military service, *management knowledge*, 8:5-21
- [37] Maslach C. [2003] Job burnout: New Directions in Research and Intervention. (Psychology Department, University of California, merican psychological Society)
- [38] Soderfeldt M, Soderfeldt B, Warg L. [1995] Job burnout in social work, *Social work*.
- [39] Dick Margaret. [1992] Job burnout in doctorally prepared Nurse faculty.
- [40] HakanenJari J, Bakker Arnold B, SchaufeliWilmar B. [2006] Job burnout and work engagement among teachers, *Journal of School Psychology* 43. WWW.Elsevier. Com/locate/ Tate
- [41] Maslach C, Leiter MP. [2005] Reversing Job burnout: How to rekindle your Passion for your work. *Stanford Social Innovation Review*, Graduate school of Business.
- [42] Soares JF, Jablonska B. [2004] Psychosocial experiences among Primary care Patients with and without musculoskeletal pain, *Journal of Pain* 8. www.EuropeanJournalPain.com
- [43] Sharon A, Me lamed S, Toker S, BerlinerS, Shapira I. [2004] Job burnout and Health Review: Current Knowledge and Future Research Directions.
- [44] Poor Ezzat Ezzatollah. [2001] governmental management and social justice, public administrative special, *management knowledge*, management faculty of Tehran University, 14th year, 255: 83-117 .
- [45] Poor Ezzat Ezzatollah. [2003] designing a policy-making system in order to realization of social justice based on truth-oriented government Alavi, PhD thesis of TarbiatModarres University
- [46] Cohen-charash, Yochi & Paul E. Spector. [2001] The role of justice in organizations; Ameta-Analysis, *Organizational Behavior and Human decision Processes*, 86(2): 278 – 321.
- [47] Cropanzano R, Folger R. [1991] Procedural Justice and Work Motivation, In R. M. Steers, L. W. Porter (Eds.), *Motivation And Work Behavior* (5th Ed.):131-143. NY: McGraw-Hill.
- [48] Bies RJ, Shapiro DL. [1987] Interaction Fairness Judgments: The Influence of Causal Accounts. *Social Justice Research*, 1:199-218
- [49] Skarlicki DP, Folger R. [1997] Retaliation in the Workplace: The Roles of Distributive, Procedural and Interactional Justice. *Journal of Applied Psychology*, 82: 434-443.

ARTICLE

ANALYSIS OF FACTORS AFFECTING ON BIOTECHNOLOGY-BASED ENTREPRENEURSHIP IN AGRICULTURE SECTOR OF IRAN

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ABSTRACT

The major purpose of this study was to determine factors affecting on biotechnology-based entrepreneurship in agriculture sector of Iran. The total population was all experts working in agricultural research centers through Iran that 170 were selected using random sampling technique as sample of the study. By using factor analysis, six factor containing 33 variables determined about 63.58 percent of variance of biotechnology-based entrepreneurship in agricultural sector. The results of the study show that the factors were categorized into six component, namely educational, infrastructural, human resources, economic, commercial, and policy making ordered by the magnitude of their impact.

INTRODUCTION

Despite great advances in agricultural productivity and economic well-being in much of the world over the past 50 years, food insecurity and poverty continue to be serious issues in many regions [1, 2]. Moreover, in 2008, the world entered a period of deepening uncertainty and economic downturn that impacted significantly on the future security of food production and distribution systems [3].

In developing countries, there is a need for continued focus on optimizing agricultural output in conjunction with conserving the natural resources base via improved crops and crop management systems. The implications of climate change make it necessary to integrate considerations regarding adaptation, uncertainty, vulnerability and resilience into agricultural research programs and strategies. The various biotechnologies available have the potential to play a significant role in achieving these aims [4].

Biotechnology is the use of scientific and engineering principles in the biological materials processing of agents in order to provide goods and services for human use. There has been a strong tie between its existence and societal development. In other words, history has it that biotechnology has been principally associated with food, addressing such provision, and as such, acting as solutions to solving problems related malnutrition and famine in societies. Nonetheless, biotechnology has recently been coupled with the development of vital drugs [5].

Recent advances in agricultural applications of modern biotechnology show a significant potential to contribute to sustainable gains in agricultural productivity, reducing poverty and enhancing food security in developing countries. As these innovations are increasingly adopted, impact assessment becomes a critical tool for addressing potential socio-economic and environmental costs and benefits [6].

In the history, man had invented modern technologies to make his life easier. These modern technologies need new skills that make specialists to be able to use them. The specialists are establishing commercial institutes in order that they can use their skills based on this modern technologies to produce goods or present services in order to new opportunities for job be established, so technology and job has always moved toward together i.e. whenever the men invented a modern technology, there also have been produced some opportunities to make use of them, even though, having job in contemporary era has become a new structure, but it is thousands of years that mines' structures are been presented. So the following relationship is always confirmed:

New Technology = New Opportunity = New Job [7].

The biotechnological revolution has been characterized by the rapid pace of discovery in the biological sciences, and a tremendous impact on both fundamental and applied research. Biotechnology is multidisciplinary encompassing microbiology, chemistry, biochemistry, genetics, molecular biology,

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immunology, cell and tissue culture and physiology, as well as engineering. Proponents around the world project a positive future in which biotechnology overcomes food shortages, improves the environment, heals or eliminates disease and leads to a prosperous and healthy society [8].

The application of biotechnology in agriculture offers a wide range of potential benefits, yet many of these benefits will not be realized unless a number of important policy issues are resolved. These issues relate to the particular characteristic of modern biotechnology and its interface with conventional agricultural research, the proprietary nature of new technologies and its effects on industry structure, biosafety and consumer acceptance considerations and the role technological inputs play in the biotechnology diffusion process. Each issue raises important policy challenges and choices as to how the country may best deal with them. The policy implications arising from the proposed country typology suggest that there is a major sparsity of information on the current situation and attitudes to new biotechnology in developing and emerging economies. While a small number of countries are forging ahead in developing specific biotechnology products and designing policies specific to their environment, the vast majority of countries will continue, for the foreseeable future, to rely on importing modern biotechnology from abroad [6].

Furthermore, the natural food products are unable to get in future. In the same way there are several new techniques are developed in the present decade. The present situation of agricultural production faces the challenge of enhancing crop production and providing nutritionally adequate diets for the increasing population, under uncertain climatic extremes, water scarcity, in limited (and degraded at many places) land area, with more requirement of water, and in many cases with poor quality water and air, and rapid erosion of natural biodiversity. To maintain the food quality in relation to its huge production, the food security is also an important factor. The food production, quality and food security can be maintained by introducing small science in the present century. Thus small science have such a big impact, this is nothing but biotechnology [9].

According to the study by Tonukari (2004), biotechnology is now one of the hot areas driving the stock markets as well as a frontier of knowledge and job creation. Just as the provision of research grants is a major issue, entrepreneurship and financing for biotechnology companies should also be high on government policy and educational agenda. Biotechnology can only be entrenched in developing countries with the establishment of a strong research base and entrepreneurial culture. Developing countries' scientists who summon enough courage to take part in these ventures will become part of the business elite of the future. Finally, any country that can assist its scientists and entrepreneurs in successful biotechnology start-ups will enjoy economic growth.

According to the mentioned studies and regarding to the importance of biotechnology-based entrepreneurship in agriculture sector, it is essential to identify its effective factors. The purpose of this study is to outline the factors affecting on biotechnology-based entrepreneurship in agriculture sector of Iran.

MATERIALS AND METHODS

Research methodology applied in this study was descriptive and quantitative methods. The main goal of the study was to identify factors affecting on biotechnology-based entrepreneurship in Iran agriculture sector. The statistical population included agricultural experts working at the research institutes through Iran and having knowledge and information or practical experience on Biotechnology was considered as a criterion for selecting these respondents. Applying stratified sampling technique, 170 agriculture experts were selected. The data were collected through a well-structured questionnaire.

The content validity of questionnaires was measured by a group of biotechnology specialists. It was modified according to comments and suggestions of the judgment group. In order to investigate the reliability of research questionnaire, 25 agricultural experts were randomly selected and they completed the questionnaire. Cronbach's alpha for the respondents' questionnaires were 0.87 respectively. Cronbach's alpha coefficient, a measure of internal consistency, was used to estimate the reliability of the survey questionnaire. This coefficient ranges in value from 0 to 1 and 0.87 indicating an acceptable level of reliability.

In current study, descriptive and inferential statistics were used to analyze the collected data. Descriptive statistics included frequency values and inferential statistics included exploratory factor analysis technique. The main objective of this technique is to classify a large number of variables into a small number of factors based on relationships among variables. For this purpose 42 variables were selected for the analysis. To determine the appropriateness of data and measure the homogeneity of variables about biotechnology-based entrepreneurship from the viewpoints of agricultural experts in Iran, the Kaiser-Meyer-Olkin (KMO) and Bartlett's test measures were applied. These statistics show the extent to which the indicators of a construct belong to each other. KMO and Bartlett's test obtained for these variables show that the data are appropriate for factor analysis [table 1]. The Kaiser criterion also was utilized to arrive at a specific number of factors to extract. Based on this criterion, only factors with Eigen-values greater than one were retained.

Findings

The results of descriptive statistics indicated that agriculture experts who participated in the study ranged in age from 27 to 58 years. The mean age of respondents was 38.6 years. 86.3% of experts were male and the rest (13.7) were female. Experts were asked to report their scientific and educational degree: 45.2% of respondents were post graduate; 30.6% were assistant professor; 15.7% had associate professor degree; and 8.5% were professor. 43.8% of respondents had a master's degree and 56.2% had completed PhD degree. Also experts were asked to indicate the number of years of job experience that they possessed. Years of job experience ranged from 3 to 30 years ($M=13.5$; $SD=7.1$).

In this study, from all 42 variables, 33 variables were significantly loaded into six factors. These factors explained 63.58 percent of total variance in components of biotechnology-based entrepreneurship. According to the Kaiser criterion, six factors with eigen-values over one were extracted. The eigen-values and percentage of variance explained by each factor are shown in table 2. Eigen-values drive the variances explained by each factor. Sum of squares of factor's loadings (eigen-values) indicates the relative importance of each factor in accounting for the variance associated with the set of variables being analyzed. According to table 2 eigen-values for factor 1 through 6 are 5.51, 4.62, 4.17, 3.63, 3.01 and 2.39, respectively.

Table 1: KMO measure and Bartlett's test to assess appropriateness of the data for factor analysis

KMO	Bartlett's test of sphericity	
0.884	Approx. chi	square Sig.
	2.896 * 10 ³	0.000

The percentage of trace (variance explained by each of the five factors) is also shown in [Table 2]. The traces for factor 1 through 6 are 15.49, 13.03, 11.80, 10.17, 8.55 and 6.81 respectively. The total percentage of the trace indicates how well a particular factor accounts for what all the variables together represent. This index for the present factors shows that 65.85 percent of the total variance is represented by the variables contained in the factor matrix.

Table 2: Number of extracted factors, eigen-values and variance explained by each factor

Factors	Eigen-value	% of variance	Cumulative % of variance
1	5.511	15.487	15.487
2	4.621	13.032	28.519
3	4.171	11.805	40.324
4	3.634	10.174	50.498
5	3.010	8.549	59.047
6	2.388	6.806	65.853

The Varimax rotated factor analysis is shown in [Tables 3-8]. In determining factors, factor loadings greater than 0.50 were considered as to be significant. The classification of the factors into six components was displayed in [Table 3]. The variables were classified in educational, infrastructural, human resources, economic, commercial, and policy making. As anticipated, the first factor accounts for 15.487 percent of variance and 6 variables were loaded significantly. These variables were presented in [Table 3].

Table 3: Variables loaded in the first factor using varimax rotated factor analysis

Name of factor	Variables loaded in the factor	Factor loadings
Educational component	Training M.Sc. and Ph.D. students in the field of biotechnology	0.683
	Introducing successful entrepreneurs in other high-technologies	0.756
	Planning abroad training courses for biotechnology faculty	0.864
	Holding workshops in the field of biotechnology transfer to businesses	0.854
	Educational programs about biotechnology businesses for students	0.861
	Utilization of academic and industry experts for scientific consultations	0.637

A relevant name for this on loading's pattern is "educational component". Eigen-value of this factor is 5.511, which is placed at the first priority among the components for biotechnology-based entrepreneurship in agricultural sector in Iran.

The second factor contains 6 variables relating to "infrastructural component". The eigen-value for this factor is 4.621 which explain 13.032 percent of the total variance [Table 4].

Table 4: Variables loaded in the second factor using varimax rotated factor analysis

Name of factor	Variables loaded in the factor	Factor loadings
Infrastructural component	Access to the tools, equipment and laboratories equipped with Biotechnology	0.784
	Creating databases and networking knowledge for development of biotechnology	0.855
	Utilizing entrepreneurial experience in other high-technologies	0.749
	Biotechnology standardization in areas of research, production and development	0.752
	Access to the methods of R&D in the field of biotechnology in other countries	0.786
	Establishing advanced R&D systems in order to create bio-innovations	0.856

The name assigned to the third factor is “human resources component”. This factor with eigen-value of 4.171 explains 11.805 percent of the total variance of biotechnology-based entrepreneurship in agricultural sector [Table 5].

Table 5: Variables loaded in the third factor using varimax rotated factor analysis

Name of factor	Variables loaded in the factor	Factor loadings
Human resources component	Biotechnology experts with entrepreneurial characteristics and skills	0.777
	Biotechnology researchers and experts empowered with the ability to find new ideas	0.727
	Experienced administrators with the ability of managing biotechnology activities	0.710
	Educators and teachers familiar with the concepts of entrepreneurship and businesses	0.638
	Experienced research team to develop R&D activities in biotechnology	0.615

The fourth factor is associated mostly with the variables related to economic affairs. Thus this factor can be named as “economic component”. These variables explain 10.174 percent of total variance [Table 6].

Table 6: Variables loaded in the fourth factor using varimax rotated factor analysis

Name of factor	Variables loaded in the factor	Factor loadings
Economic component	Participation of government and private sector investment in biotechnology	0.637
	Reform of banks and insurances regulations to provide services to bio-entrepreneurs	0.749
	Infrastructure in order to attract foreign investment and pushing them to biotechnology	0.792
	Granting tax benefits to investment funds specialized in the field of biotechnology	0.814
	Encourage banks and financial institutions to provide facilities for bio-entrepreneurs	0.806
	Reduced tax rate for companies and institutions in the field of biotechnology	0.838

The fifth factor is associated with the variables related to business development. Thus, this factor can be named as “commercial component”. The eigen-value for this factor is 3.010, which explain 8.549 percent of the total variance [Table 7].

Table 7: Variables loaded in the fifth factor using varimax rotated factor analysis

Name of factor	Variables loaded in the factor	Factor loadings
Commercial component	Developing techno-markets for exchange bio-products between innovators with investors	0.617
	Identification of potential domestic and foreign markets in the field of biotechnology	0.797
	Encourage SMEs to participation in design and implementation of biotechnology programs	0.814
	Creating demand-driven R&D institutes in the field of biotechnology	0.866
	Creating professional networks between bio-producers and SME	0.765

The name assigned to the six and last factor is “policymaking component”. This factor with eigen-value of 2.388 explains 6.806 percent of the total variance [table 8].

Table 8: Variables loaded in the first factor using varimax rotated factor analysis

Name of factor	Variables loaded in the factor	Factor loadings
Policymaking component	Coordination and cooperation between governmental organizations in the field of biotechnology	0.796
	Reforming commercial laws in order to development of biotechnology businesses	0.766
	Material and intellectual support of the development of new ideas in the field of biotechnology	0.739
	Predict the necessary provisions for rapid absorption and application of biotechnology innovations	0.832
	Support for the holding of training programs and human resource development in biotechnology	0.789

Discussion

Biotechnology is the application of scientific techniques to modify and improve plants, animals, and microorganisms to enhance their value. Agricultural biotechnology is the area of biotechnology involving applications to agriculture. Agricultural biotechnology has been practiced for a long time, as people have

sought to improve agriculturally important organisms by selection and breeding. This study is to investigate the factors affecting on biotechnology-based entrepreneurship in agriculture sector of Iran.

Based on the finding of this study, the variables were categorized into six groups, namely educational, infrastructural, human resources, economic, commercial, and policy making components ordered by the magnitude of their impact. The results revealed that six components containing 33 variables determined about 65.85 percent of total variance in biotechnology-based entrepreneurship in agricultural sector.

In assessment of factors affecting on biotechnology-based entrepreneurship, educational component was found out to be first and the most important factor influencing the biotechnology-based entrepreneurship in agricultural sector. Therefore designing training programs for technology-based entrepreneurial development will be very helpful.

Based on the studies of Indian department of science & technology, Technology-based Entrepreneurship Development Program (TEDP) is a program in which training is given on specific products/technologies/processes, which have commercial viability and which have been developed by R&D labs or other academic institutions. This program provides state-of-the-art inputs to the entrepreneurs about the technology to be employed and they can also develop their skills in application of the technology [10].

According to the findings, infrastructural component were placed at the second most important factor affecting biotechnology-based entrepreneurship in agricultural sector in Iran. Also the results of the study show that human resources, economic, commercial, and policy making components also influence the biotechnology-based entrepreneurship in agricultural sector of Iran.

CONFLICT OF INTEREST

There is no conflict of interest

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REFERENCES

- [1] FAO. [2008] the state of food insecurity in the world 2008: High food prices and food security – threats and opportunities. Rome. Available at www.fao.org/docrep/011/i0291e/i0291e00.htm.
- [2] FAO. [2009] Crop prospects and food situation. Global Information and Early Warning System on Food and Agriculture 1: Rome. Available at www.fao.org/giews/.
- [3] Nellemann C, MacDevette M, Manders T, Eickhout B, Svihus B, Prins AG, Kaltenborn BP. [2009] the environmental food crisis – the environment's role in averting future food crises. A UNEP Rapid Response Assessment. United Nations Environment Program, GRID-Arendal. Available at www.grida.no/publications/rr/food-crisis/ebook.aspx.
- [4] FAO. [2011] Biotechnologies for Agricultural Development. Proceedings of the FAO International Technical Conference on "Agricultural Biotechnologies in Developing Countries: Options and Opportunities in Crops, Forestry, Livestock, Fisheries and Agro-industry to Face the Challenges of Food Insecurity and Climate Change" (ABDC -10).
- [5] Ayobami AS, Valesca A, Vidal BF, Vasco A. [2013] Biotechnology and Agriculture. Journal of Biosafety Health Education, 1(2): 1-7.
- [6] Burgeat E, Tangermann S. [2003] Accessing Agricultural Biotechnology in Emerging Economies. Organization for Economic Co-operation and Development (OECD).
- [7] Uskokovic V, Ševcosic M, Uskokovic DP. [2010] Strategies for the Scientific Progress of the Developing Countries in the New Millennium. Science, Technology & Innovation Studies 6(1): 33-62.
- [8] Tonukari NJ. [2004] Fostering biotechnology entrepreneurship in developing countries. African Journal of Biotechnology, 3(6): 299-301.
- [9] Bhattacharyya A, Datta PS, Chaudhuri P, Barik BR. [2011] Biotechnology: A new frontier for food security in socio economic development. Disaster, Risk and Vulnerability Conference, March 12–14.
- [10] Anonymous. [2011] Annual Report 2010-2011. Department of Science & Technology, Ministry of Science & Technology, India. Available at www.dst.gov.in/about_us/ar10-11

ARTICLE

IDENTIFICATION AND PRIORITIZATION OF EFFECTIVE FACTORS ON DEVELOPMENT OF RURAL BUSINESSES WITH AHP ATTITUDE (CASE STUDY: DEHKAHAN VILLAGE, CITY OF KAHNUJ)

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ABSTRACT

Nowadays the biggest disaster in human societies, especially in rural societies where are the concentration centers of the underprivileged communities in the developing countries, is unemployment. In order to decrease unemployment problems and to reinforce rural areas, there should be fundamental activities to compile new methods of organizing businesses which are different from the ordinary employment systems. The objective of this survey is identification and prioritization of effective factors on development of rural businesses in the Dehakan village in the city of Kahnuj. First, these factors were identified by Delphi technique, and then, each one's level of effectiveness on development of rural businesses was determined by AHP. The statistical society includes 30 experts of three sectors: the related government sector workers, the private sector workers, and social sector workers. This study is descriptive-survey type and the tools of data collection are questionnaires. The research findings showed that seven main factors (infrastructural, economic, marketing, educational-promotional, individual-social, environmental and political-legal factors) and 29 sub-criteria are important in development of rural businesses in Dehakan village. The findings also showed that the first priority is marketing, then respectively the economic factor, educational-promotional, individual-social, political-legal and infrastructural factors stand in the following positions. The environmental factor was at the bottom of the list.

INTRODUCTION

In the present-day human societies, one of the biggest problems is unemployment. This problem is more apparent in the rural communities which are the canons of poverty in the developing countries. These communities are not only victims of unemployment, disorder and lack of plans, but they are also victims of environmental conditions and necessities. Now, the real help to the underprivileged is not donating them charities, but it is bringing changes to their behaviors and characteristics and to let them know that giving charities is not an urgent issue. For reducing the immediate problems of unemployment, empowerment and creating capabilities (in the rural areas), there must be infrastructural activities carried out for compilation of new methods of organizing businesses for future; activities which are different from the ordinary and common employments [1]. Small and variable businesses can protect rural economy against national economic changes [2]. Promotion of entrepreneurship and rural development through productive activities is directly related to improving general living conditions and human rights [3]. Therefore, in the recent decades, to overcome economic problems ahead of rural communities, the Entrepreneurship attitude has been considered as an important solution of rural development. Entrepreneurship is a targeted process and activity which combines risk-taking, creativity, innovation and personal success, and it requires taking economic, behavioral and social responsibilities for starting new and profitable businesses. Entrepreneurship can develop trade and business in the agricultural and non-agricultural jobs. Agriculture-related activities such as: farming, gardening, animal husbandry, keeping honey bees, and activities like forestry, fishery and preserving natural resources, environment conservation, development of rural industries (handicraft, home, workshop and factory industries), rural tourism, are the most important foundations of Entrepreneurship in the rural areas. These are the main elements and structures of small businesses; and as new opportunities, they can help overcome existing problems such as unemployment, poverty, immigration and can help reduce inconveniences [1]. According to the published statistics of the UN, approximately 62% of world population lives in the rural areas. In this sense, because of including big masses of world human population, especially in the rural areas of the developing countries, rural societies are specifically important. Today's rural communities often encounter problems such as lack of information, less effective skills, weak entrepreneurial prospect, and ethnic and tribal discrimination. These characteristics differentiate them from other communities [4]. Rural entrepreneurs' challenges are as following: the villages remoteness and puniness, access to the wealth, access to technological knowledge, less effective skills. Considering the activities carried out in different countries of the world, including Iran, rural businesses are facing different challenges such as issues related to human resources, reduction of population and small local markets, farness from rural areas, financial sources, competitiveness, communication and transportation infrastructures, rules and regulations, social and cultural obstacles, focusing on one special industry or business, and lack of sponsoring organizations [5]. Despite these challenges, rural areas provide various advantages for establishing different businesses. Also because of having lots of natural and human resources, villages of Iran can be the basements for advent of many new and Entrepreneurship businesses [6].

KEY WORDS

Development, village businesses, Entrepreneurship, Delphi technique, Analytic Hierarchical Process

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Generally, there are three strategies for development of rural Entrepreneurship: 1: Attracting businesses from other areas (especially urban areas) to villages 2: Maintaining and developing the existing businesses through supporting policies 3: Supporting creation and development of new businesses within the rural areas. The third option is usually considered more and, compared to the other two options, it is more practical. Therefore, the point is that in order to do businesses and create new jobs, there are good potentials in the villages, but so far, the influential and facilitating factors have not been researched, identified and presented before job creators. So, this article tries to identify and prioritize the important factors on rural businesses.

Research background

Different studies have been carried out on rural businesses and Entrepreneurship and also on the influential factors on them in order to achieve economic development for villages. In this part, a review of the carried out domestic and foreign studies in this regard will be presented. First, the carried out studies in Iran on this subject will be presented: Rokn-ud-Din Eftekhari and Taherkhani, studied establishment of industry in villages and its role in welfare of rural areas. They concluded that industrialization of villages, as part of the rural development in all aspects, meets the most important objectives of development in the rural areas and alongside Entrepreneurship and increasing income of low-income rural groups, it reduces poverty and increases welfare of rural areas. Moti'i et al explained the influential factors on empowerment of villagers in development of Entrepreneurship; they identified ten influential factors on empowerment of villagers for developing Entrepreneurship [7]. These factors, according to their degree of influence, are: effort, organization, finance and economy, education and roll modeling, individual independence, previous experiences, creativity, sense of success, and internal locus of control. As a result, existence of individual and environmental factors is influential in increase of empowerment of villagers for creation and development of businesses. Abdullah Zadeh et al (2014), in their survey, studied the requirements of starting businesses in rural areas and concluded that receiving technical and specific training on the related business, increase of self-confidence at work, and gaining occupational and practical experiences have the biggest influences[8]. Farahani et al (2014) studied the influential factors on growth of Entrepreneurship in rural areas and identified eight factors; out of these factors, the most important one was the infrastructural and social factor. The following factors were respectively economy, knowledge and awareness, self-confidence, individual creativity, innovation and creativity, physical infrastructure, and access to economic facilities [9]. HeidariSareban (2015) studied the influential factors on success of rural job creators and the results showed that the most important elements on success of job creators are 6 elements (empowerment and reinforcement of economic infrastructure, reinforcement of legal and informational infrastructure, strengthening motivation and commercializing agriculture, institution-building and capacity-building, and strengthening social participation and aggregation of scattered villages) [10]. Wendy and Chung (2007), in their study titled 'Theorizing a framework of factors influencing" performance of women entrepreneurs in Malaysia', stated that the main obstacles before women's rural Entrepreneurship are: low social position, inappropriate living environment, low information, lack of demand, lack of access to resources, dispersion of villages, lack of access to knowledge and low levels of skills [11]. Olujide (2008) in his survey titled 'Attitude of the youth towards projects of rural youth' concluded that there is a significant relationship between attitude towards employment in agriculture and level of rural youth's participation in the rural development projects. Zografos (2009) studied the role of social companies in reconstruction of rural areas and the results showed that with development of Entrepreneurship in the rural areas, social and environmental indices improve and sustainable development of rural areas can be achieved. Thumbunan (2009), in his study titled 'Women's entrepreneurship in Asian developing countries' concluded that lack of capital, high price of inputs, high expenses of labor force, lack of proper technology, and lack of skilled labor force are some of the most important obstacles for development of small and medium Entrepreneurship entrepreneurs. Folmer et al (2010), in their article, have studied the effective factors on rural industrial Entrepreneurship among farmers. The results showed that all job creators do not receive support from their families; and the capital market can fill this gap by founding financial institutes, elevation of educational plans and providing exemptions from taxes [12]. Alonso and Trillo (2014), in their article titled 'Women, rural environment and Entrepreneurship ', stated that except considering equal behavior between women and men, there are not special mechanisms presented for women. The offered work is that social and economic situation of women in the rural areas of Spain at the moment be analyzed and studied; and by doing initial diagnosis, suggestions be made for improvement of employment and economic conditions of women through Entrepreneurship in activities and in special sectors [13].

Theoretical principles

Concepts and definitions of rural business

In Oxford Dictionary, business means "buying and selling, and commerce". In Longman Dictionary, business means "the activity of making money, and commerce through which money is made". In simple words, business means a form of being busy; and generally, it includes activities that contain production and buying of goods or services with the purpose of selling them and gaining profit [14]. In other words, business means every type of money-making in which services or things which other members of society need, would like to buy, and can pay for, are produced, distributed and offered. Every exchange that includes buying and selling is not business, but business is every repetitive and reviving exchange of buying and selling. Considering these mentioned definitions, characteristics of business are: selling or transferring goods and services for

gaining value, dealing of goods and services, motivation of benefit, and activity along with risk. Therefore, considering these definitions and variables that were mentioned for business, domain and factors of business were presented in the framework of different categorizations. According to one of the most important categorizations, businesses are divided into three main categories: 1. Industrial businesses, 2. Service businesses, 3. Trade businesses [14].

Briefly, industrial businesses deal with production of goods and raw material, whereas service businesses deal with distribution, and trade businesses mean mediation. In another division, businesses are divided into six groups: 1. Electronic businesses 2. Domestic businesses 3. Family businesses 4. Rural businesses 5. Small and medium businesses 6. Big businesses [15].

Rural businesses

Considering the small sizes of villages, rural businesses are in small scales, and considering the domination of agricultural and workshop activities, they have special efficiencies [1]. A review of the carried out studies in this regard show that there is a shift in the rural businesses from businesses based on agriculture to general businesses. Nowadays, development of small and medium businesses is considered as one of the important solutions for Entrepreneurship and increasing income of people in the rural areas. Small and medium economic entrepreneurs are identified as vital means for economic reinforcement of villagers. Development of small economic rural businesses, along with creation and reinforcement of spirit of Entrepreneurship, can accelerate the process of rural development as a fundamental solution. On the other hand, by development of these types of businesses and strengthening the spirit of Entrepreneurship among villagers, the foundation and pre-requisites of combining sources can be provided both inside the villages and outside them. In this way, the required conditions can be provided for improving the life quality of individuals, families and social lives of villagers; and the required tools can be provided for stabilizing healthy economies and environments for the villagers [16]. Walstad and Kourilsky (1996) proposed a model with four important factors that have significant role in entrepreneurial businesses. These factors are as following:

- Society's attitudes towards small businesses and entrepreneurship
- The attitudes towards implementation of entrepreneurial businesses
- Accepting government and taxes regulations
- Entrepreneurial and entrepreneurship education Knowledge.

All over the world, especially in the developing countries, the most fundamental businesses belong to villagers, and they play the most important roles in the economies of their countries.

On this basis, Entrepreneurship is one of the ways that provide new opportunities for job creators through which they can elevate the life standards in the rural communities by establishing new economic institutions in small and medium businesses [17].

Rural entrepreneurship

The word entrepreneur comes from the French verb *entreprendre*, which means to undertake (Landström 2005). Joseph Schumpeter contributed significantly to the theory of entrepreneurship through his seminal book *The Theory of Economic Development* in which entrepreneurship is viewed as the primary engine of economic development, with innovation as a central element (Lordkipanidze et al. 2005). With regard to rural areas, which encompass territories with specific physical, social and economic characteristics, there is increasing demand and interest in proposing entrepreneurship as a new form of business and therefore as a key element in the process of rural development, especially in areas where development is sluggish. Rural entrepreneurship is defined as 'the creation of a new organisation that introduces a new product, serves or creates a new market, or utilises a new technology in a rural environment' (Lúcia Pato and Teixeira, 2016). Rural entrepreneurship is defined as 'the creation of a new organization that introduces a new product, serves or creates a new market, or utilises a new technology in a rural environment' (Wortman 1990). In fact, rural Entrepreneurship has no difference with the general concept of Entrepreneurship. Regan believes that rural Entrepreneurship meets the requirements of employment, increase of income and production of wealth, improves life quality and supports local people to participate in the improvement of economy (Regan, 2002). According to Wortman rural entrepreneurship refers to creating new organization which introduces or offers a new service or production, creates a new market, or it makes use of new technology in rural environment (Heriot, 2002). The foundations of using Entrepreneurship in the rural areas and in the agricultural sector are very wide and various. In fact, these areas are considered as untouched environments for Entrepreneurship. Activities related to agriculture sector, such as farming, gardening, maintaining green houses, animal husbandry, honey bee farming, as well as foresting, watershed management, preserving and developing environment, development of rural industries and process industries such as domestic industries, handicrafts, workshops and manufacturing, rural and country tourism, activities related to nomads, rural housing, etc. are most important beds for Entrepreneurship in agricultural sector in the rural areas [18]. Generally, Entrepreneurship leads to formation of small-scale and new economic activities with individual and group capitals [19]. Some of the obstacles before rural Entrepreneurship are lack of the culture of supporting Entrepreneurship, farness from market and services, lack of access to capital, lack of network and communicational opportunities and lack of industrial clusters that can accelerate innovation (Mark Lee, 2002). Therefore, Entrepreneurial activity faces lots of obstacles. Because of that, for

successful rural Entrepreneurship performance, this point should be considered that how job creators use their knowledge, resources and networks . By getting influence from different factors such as individual features and motivations, education, culture and customs, rules, policies and technical knowledge, Entrepreneurial activities can bring different results in terms of behavioral, economic, social, and other patterns (Alison, 1990). Therefore, Entrepreneurship in the rural areas can create a modern order for development of business in the rural areas.

Introduction of conceptual model of the survey

In this survey, influential factors on development of rural businesses are studied. The main pivots of this model include seven factors i.e. economic, infrastructural, marketing, individual-social, educational-promotional, environmental and political factors. [Fig. 1]

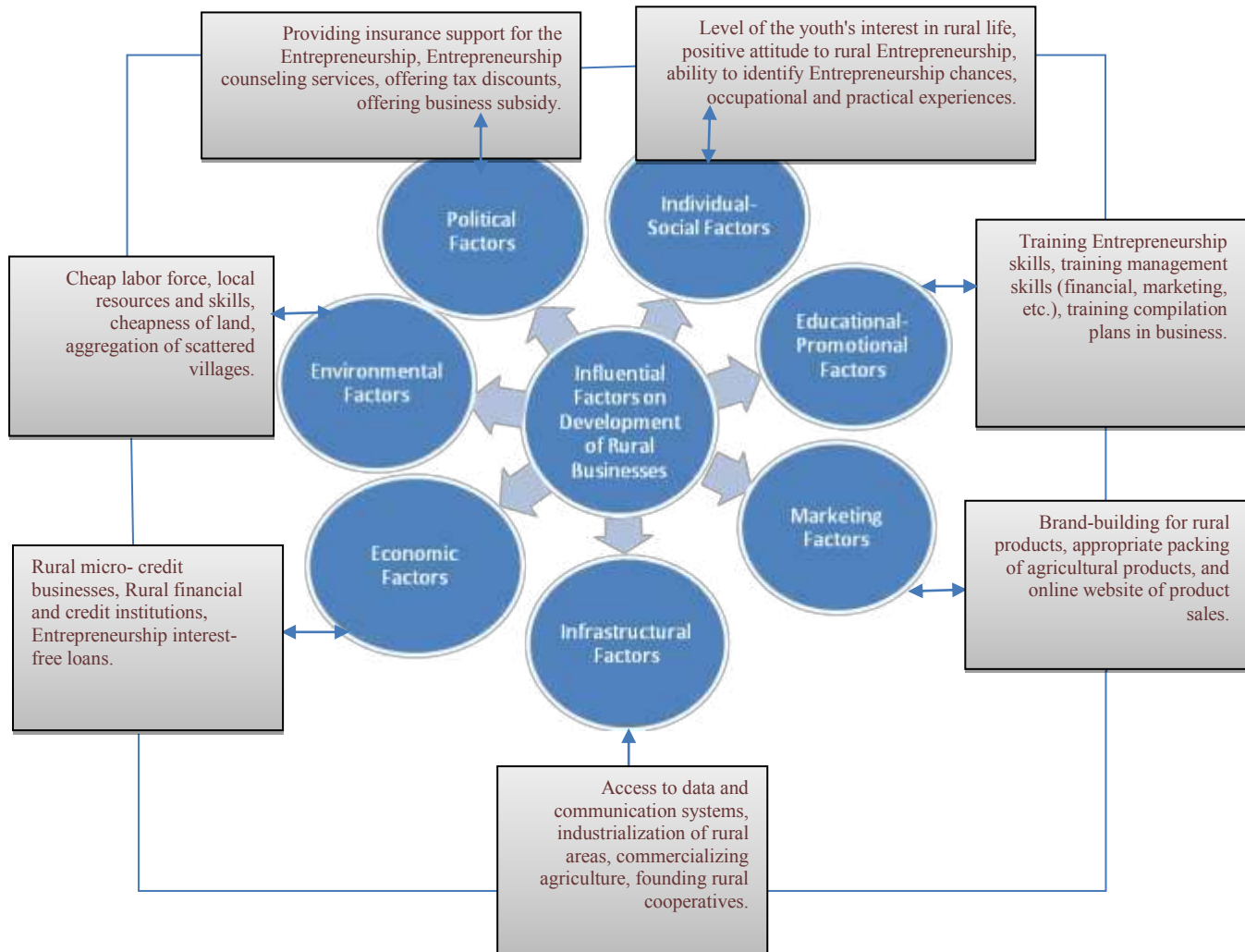


Fig. 1: Research conceptual model

METHOD

The present study, considering the nature of the issue and its objective, is descriptive-applied type, and on the basis of methodology, it is survey. In the course of the survey, for identifying the factors and the sub-phenomena, Delphi method, and for prioritizing the factors and sub-phenomena, AHP was applied. Considering the objective of this study which is identifying effective factors on development of rural businesses in the Dehakan village in the city of Kahnuj, the target statistical society of the research includes three parts: related government sector activists (governor, governor of the district, village cooperative, and construction jihad organization), activists of the private sector (capital owners, legal and real persons of business), and activists of social sector (VA, Islamic Council). Statistical sample includes 30 members of experts and specialists of the studied society who have been selected through simple census. In the present study, for data collection, library and field research methods have been used. In order to compile the principles, definitions and theoretical concepts, as well as research background, library sources were used. It included most important and most useful search engines on the internet, proceedings of presented

articles in scientific conferences, thesis papers and books from libraries of universities. Justifiability of research questionnaires is of the content justifiable type. In this regard, the content of the questionnaires were studied by supervising professors, research counselors, and a number of experts and elites in this field. On the other hand, tools of data collection, considering the applied method in this study, have reasonable justifiability (content). Validity and perpetuity of the questionnaire (AHP) which is standard is measured by ratio of incompatibility. Perpetuity of the questionnaire was measured 0.03.

Analytic hierarchical process (ahp)

Analytic Hierarchical Process (AHP) is one of the most powerful multi-phenomena decision-making methods. Stages of solving a problem in this method include the following main steps. Step 1: modeling. It means determination of "objective", "indices" and "options". In this step, the objective of decision-making hierarchically comes out of decision elements which are related to one another. The process of hierarchical analysis requires breaking of a decision problem with several indices into a hierarchy of levels. The first level shows the main objectives of decision-making process and the second level shows the main and basic indices which might break into minor and smaller indices in the next level. The third level presents the decision options. This hierarchy is shown in [Fig. 2].

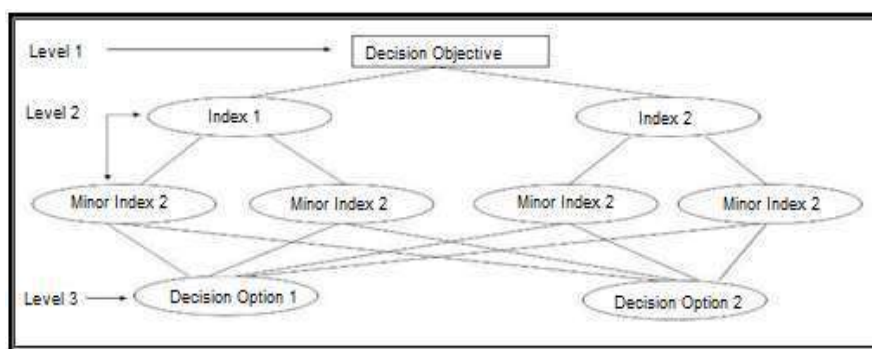


Fig. 2: Hierarchical display a matter of decision

Step 2: Data collection and formation of matrixes of even comparisons. In this step, different expenses are compared every time in relation to one index by the decision-maker, and also indices to one another, two by two; and the results of comparison are presented in tables called matrixes of pair comparisons. This pair comparison is conducted by allocating numerical scores which show priority or importance of two elements. [Table 1] is used for this purpose.

Table 1: Basic scales of hierarchical analysis process for pair comparison

Preference Value	Comparison situation of i to j	Explanation
1	Equal importance or preference	The i option or index in relation to j is in the same level of importance or they don't have superiority over each other.
3	Almost important	Option or index i is almost more important than j
5	More important	Option or index i is more important than j
7	Much more important	Option or index i has more preference and is much more important than j
9	Infinitely more important	Option or index i is infinitely more important than j, so much so that it is not comparable to j
2, 4, 6, 8		Shows mediate values between preference values. For example, 8 shows more importance than 7 for i, but not so much that makes it incomparable to j

Step 3: measurement of comparative steps. For every one of the matrixes of pair comparisons achieved in the previous step, the weight of options on the basis of every index and also the weight of indices in relation to one another are measured. Summary of this operation for every matrix is as follows: 1. calculate the collection of numbers in every column of the pair comparison matrix, and then divide every element of the column by collection of the numbers of that column. The newly achieved matrix is called "normalized pair comparison matrix". 2. Find the average number of every line of normalized pair comparison matrix. This average value shows the relative weight of decision elements accordant with matrix lines. **Step 4:** measuring the final weight. In this step, measured relative weights of options are merged together while the weights of indices are considered, and the final weights of options calculated and prioritized. **Compatibility in judgments:** approximately all measurements related to AHP are carried out on the basis of the initial

judgment of the decision makers which appear in the form of matrix of pair comparisons; and every error and conflict in comparison and determination of importance between the options and indices disconcerts the final results of calculations. Conflict ratio (CR) is a means that determines compatibility of judgments and shows to what extent priorities resulted from comparisons can be trusted. Perhaps, comparing two options for one case is an easy task, but by increase in the number of comparisons, certainty about compatibility of comparisons cannot be guaranteed and this certainty has to be achieved by applying conflict ratio. Experience shows that if the conflict ratio is below 0.1, compatibility of comparisons is acceptable; otherwise, the comparisons have to be repeated. The following steps are used for calculating the conflict ratio: Step 1: calculating the vector of weight collection: multiply pair comparison matrixes by perpendicular vector of relative weights. Name the new achieved vector in this way as weighted support vector (WSV). Step 2: calculation of compatibility vector: divide the elements of weight support vector by the relative priority vector. The achieved vector is compatibility vector (CV). Step 3: achieving λ : average of the elements, compatibility vector gives λ Max. Step 4: calculating the compatibility index (CI): this index is defined as follows:

$$CI = \frac{\lambda_{Max} - n}{n - 1}$$

n is the number of existing options in the equation. Step 5: calculating the conflict ratio: conflict ratio is achieved by dividing compatibility index by random index (RI):

$$CR = \frac{CI}{RI}$$

Random index (RI) is extracted from table 2 (Mehregan, 2005).

Table 2: Random index

n	1	2	3	4	5	6	7	8	9	10
RI	0	0	.58	0/9	1/12	1/24	1/32	1/41	1/45	1/51

Analysis

Prioritizing effective elements on development of rural businesses (of Dehkahan village in the city of Kahnuj) by the use of Analytic Hierarchical Process (AHP): first step is identifying and determining of criteria and options of this model. On this basis: 1. Objective: determining effective indices on development of rural businesses (of Dehkahan village in the city of Kahnuj). Criteria and indices for achieving the objective are: infrastructural factor, economic factor, marketing factor, educational-promotional factor, individual-social factor, environmental factor and political-legal factor. 2. Sub-criteria: for every one of the criteria there are some sub-criteria considering the pair comparison questionnaire. The second step after determining the model criteria and sub-criteria is pair comparison between every sub-criterion that is effective on every criterion considering the opinions of the experts. The third step after pair comparison between sub-criteria in every criterion is to estimate the level of importance of every criterion in relation to the objective.

Table 3: Matrix of calculating the relative weight of the importance of every one of the main criterion in relation to the objective

Criteria	Relative Weight Average	Final Priority	Conflict Ratio
Marketing factor	0.331	1	0.03
Economic factor	0.231	2	
Educational-promotional factor	0.165	3	
Individual-social factor	0.110	4	
Political-social factor	0.070	5	
Infrastructural factor	0.055	6	
Environmental factor	0.037	7	

The above table [Table 3] shows the amount of importance of every one of the criteria in relation to the objective. In other words, relative weight average of every one of the criteria shows to what extent these factors can be effective in development of rural businesses (Dehkahan village in the city of Kahnuj). Its weight vector is also as follows: [Fig. 3]



Fig. 3: Ranking vector of indices related to effective factors on development of rural businesses

The fourth and final step is combining the relative weights; in other words, after doing pair comparison and calculating relative weights of sub-criteria and criteria, it is required that final weight of every option be calculated:

Table 4: Matrix calculation of the relative weight and final weight of each sub-criterion

Sub-criteria	Relative weight	Final weight	Final priority	Conflict ratio
Brand-building for rural products	0/462	0.158	1	0.03
Granting surety-free Entrepreneurship loan	0/571	0.110	2	
Proper packing of agricultural products	0/274	0.093	3	
Training Entrepreneurship skills	0/467	0.078	4	
Sales websites	0/178	0.061	5	
Small credits of rural businesses	0/286	0.055	6	
Ability of identifying rural opportunities	0/419	0.052	7	
Training management skills (financial, marketing, etc.)	0/277	0.036	8	
Occupational and practical experiences	0/263	0.033	9	
Granting business subsidy	0/431	0.033	10	
Clustering businesses	0/086	0.029	11	
Rural financial and credit institutes	0/143	0.027	12	
Training compilation of business plan	0/160	0.027	13	
Commercializing agriculture	0/448	0.026	14	
Cooperation and participation	0/160	0.020	15	
Local resources and skills	0/467	0.018	16	
Industrializing rural areas	0/283	0.017	17	
Promoting Entrepreneurship culture	0/095	0.016	18	
Granting tax discounts	0/204	0.016	19	
Providing insurance support for Entrepreneurship	0/189	0.015	20	
Positive attitude to Entrepreneurship	0/097	0.012	21	
Formation of rural cooperatives	0/164	0.010	22	
Cheap labor force	0/277	0.010	23	
Level of the youth's interest to live in the villages	0/062	0.008	24	
Policy of supporting threats rising from mediators	0/108	0.008	25	
Access to data and information systems	0/106	0.006	26	
Aggregation of scattered villages	0/160	0.006	27	

Entrepreneurship counseling services	0/067	0.005	28	
Cheapness of land	0/095	0.004	29	

The [Table 4] is the final result of Analytic Hierarchical Process. In other words, this table respectively shows the most important factors regarding their effects on development of rural businesses. Considering the calculated final weight, the highest importance belongs to brand-building for rural products.

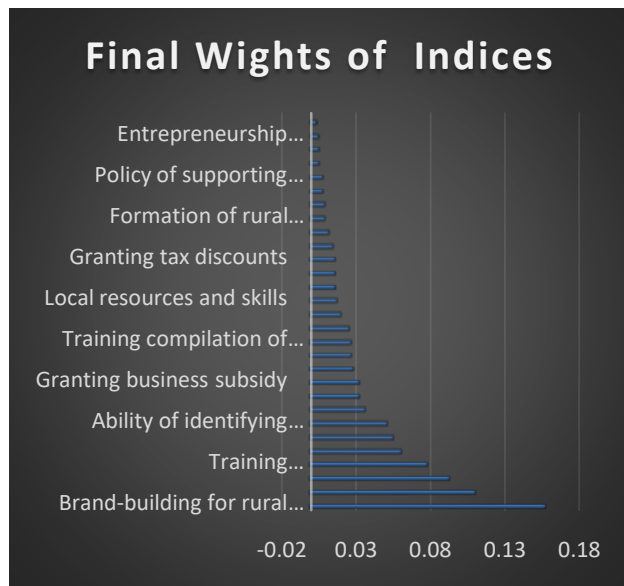


Fig. 4: Final weights of indices in the seven main groups

Considering the [Fig. 4], Brand-building for rural products, Granting surety-free Entrepreneurship loan, Proper packing of agricultural products, Training Entrepreneurship skills, Sales websites are the highest priorities among all indices in the Seven main groups and all of the mentioned indices belong to the Three main factors of Marketing factor, Economic factor and Educational-promotional factor which are the most important ones between the five factors.

DISCUSSION AND CONCLUSION

After analyzing the issue in the form of hierarchy, elements of different levels were pair compared with one another and then on the basis of their levels of priority, they were valued. The results showed that prioritizing main effective factors on development of rural businesses shows that marketing factors, from the perspective of the experts of the studied field, have the highest importance and prioritization of other factors is as follows: economic factors, educational-promotional factors, individual-social factors, political-legal factors, infrastructural factors and environmental factors. In addition, in the pair comparison part between sub-criteria, the results are as follows: among the sub-criteria of marketing factors, the sub-criterion of brand-building for rural products is the first priority. After that the sub-criteria of proper packing of agricultural products and online sales website are the following priorities, and clustering of businesses is at the bottom of the list. In prioritizing the sub-criteria of economic factor, the sub-criteria of granting surety-free Entrepreneurship loan, small credits as well as rural financial and credit institutes respectively have the highest scores. In regard of the educational-promotional factors, the sub-criterion of training Entrepreneurship skills has the highest score, and after that, the sub-criteria of training management skills (financial, marketing, etc.), training compilation of business plans, and promotion of culture of Entrepreneurship respectively stand in the second to fourth ranks. In prioritizing the criteria of individual-social factor, the sub-criterion of the ability to identify rural opportunities has the highest score, and after that, the sub-criterion of occupational and practical experiences, cooperation and participation, and positive attitude to rural Entrepreneurship are the following priorities. The sub-criterion of level of the youth's interest in living in the villages has the lowest significance. In prioritizing the sub-criteria of political-legal factor, the sub-criterion of granting business subsidy with the highest score stands at the top, and after that, the criteria of granting tax discounts, providing insurance support for Entrepreneurship, and the policy of support against the threats rising from mediators stand as the following priorities, and the sub-criterion of Entrepreneurship counseling service with the lowest score stands at the bottom of the list. Among the sub-criteria of infrastructural factor, the sub-criteria of commercializing agriculture, industrialization of rural areas, founding village cooperatives, and access to the information and communication systems are the respective priorities. At last, the environmental factor has the lowest significance among the main effective factors on development of rural businesses. In prioritizing this factor, the sub-criteria of local resources and skills,

cheap labor force, aggregation of scattered villages, and cheapness of land respectively stand in the first to fourth ranks.

Calculation of final weight and ranking of effective sub-criteria on development of rural businesses in the village of Dehakan shows that out of the 29 identified sub-criteria, the sub-criteria of brand-building of rural products, granting surety-free Entrepreneurship loans, proper packing of agricultural products, training Entrepreneurship skills, online sales website, and small credits have the highest significances among all sub-criteria in the seven main groups; and all the mentioned sub-criteria belong to the three main factors of marketing, economic and educational-promotional elements which have the highest significances among the seven main factors.

In the last part of discussion in research conclusion, we study the results of similar surveys. Farahani et al (2004), in their survey, evaluated the sustainable rural development from the perspective of Entrepreneurship and employment. The research methodology is descriptive-analytic and the method of data collection is library and field study. The statistical society of this study includes the inhabitant families of 6 villages in the JaberAnsar district in the city of Abdanan. For analyzing the information, factor analysis was used with the method of analyzing main factors in the SPSS software. In conclusion, out of the eight identified factors the most effective factor in relation to Entrepreneurship and employment in the studied region belongs to the infrastructural and social factors. The following factors are respectively economic factor, knowledge and awareness, self-confidence, individual creativity, innovation, creativity, physical infrastructure, and access to economic facilities. Also Taghdisi et al (2005), in their survey, studied the effective elements on Entrepreneurship in the villages of AbadehTashk district in the city of Neiriz. The research method was survey. Theoretical information was collected through library studies, and the data related to the region was collected by distribution and filling up of questionnaires, by interviews and doing census. The studied statistical society was 1494 rural families, and according to Cochrane's scale, the sample size was achieved as 305 samples from the families. Dimensions of Entrepreneurship in this study were divided into three economic, social and infrastructural aspects. For analyzing the data, T-test was applied. The results of this study showed that the triple economic, social and infrastructural elements in the studied villages, because of negativity of single-sample T-test, are not in the desirable level and because of existence of correlation between capacities, by promoting situation of one factor, development of other factors can be accelerated. Since the infrastructural element in the villages has had the most effect on Entrepreneurship, considering this aspect is utterly important. Results of these two surveys are different from the achieved results in this survey. Results of these two surveys showed that the infrastructural element is the most effective element on development of Entrepreneurship in the studied rural regions, whereas the results of the present study showed that out of seven main factors, the infrastructural factor (by Analytic Hierarchical Process) stands in the sixth position and is introduced as one of the least significant factors that influence development of rural businesses in the village of Dehakan. In addition, the marketing factor, in the perspective of experts of the studied region, had the utmost significance. The achieved results in this survey are in accordance with the results of studies carried out by Samian et al (2005), and Heidari (2005). Samian et al (2005), in their survey titled "Studying the new methods in creating small businesses focusing on rural Entrepreneurship " worked on finding new methods for creation, reinforcement and development of small businesses in the villages of the city of Hamedan. It was a qualitative study in which the results showed that according to the experts, the required facilities, tools, and resources for creation of small rural businesses are: appropriate marketing networks, appropriate credit and banking facilities, appropriate social provision and insurance networks, appropriate telecommunication network, and appropriate transportation network. These results are in accordance with the results of this study. Also in phase with this survey, Heidari (2005), in his survey, studied the effective elements on success of rural job creators in Ardabil Province. He showed that the most important effective factors on success of rural job creators are six factors of empowerment and reinforcement of economic infrastructure, reinforcement of legal infrastructure and information system, reinforcement of motivation and commercialization of agriculture, institutionalizing, capacity-building, reinforcement of social participation, and aggregation of scattered villages. This is while as it is clear from the findings of the survey, these factors have been effective on the analysis of the present survey as well, and that they are accordant with it. According to findings of this survey, a summary of solutions for development of rural businesses are suggested:

- Holding specific training workshops on packing agricultural products for development of exports
- Holding seminars, festivals and packing design contests for rural products with focusing on exports in order to develop businesses in the rural areas
- Designing websites for selling rural products in order to do marketing and omit mediators and brokers
- Existence of desired financial institutes in the rural areas
- Social Entrepreneurship strategy in the rural areas in the fields of granting loans and Entrepreneurship for villagers
- Policy of small credits for rural businesses by the government
- Laying the foundations for encouragement of investors to founding businesses in the rural areas through government policies of granting tax discounts and Entrepreneurship insurances
- Teaching compilation of business design as well as business ecology for starting successful business, and justification of investors for investment in Entrepreneurship ideals
- Offering Entrepreneurship skills training freely for inhabitants of rural areas
- Holding festivals of rural businesses in order to promote Entrepreneurship in rural areas
- Encouragement of Entrepreneurship al behaviors in rural areas and supporting rural job creators by the authorities

- Growth of creativities in the members of rural communities and movement for applying talents and identification of potential opportunities
- Development of cooperative institutions in the rural communities and managing them by villagers.

CONFLICT OF INTEREST

There is no conflict of interest

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REFERENCES

- [1] Rokn-ud-Din Eftekhari, Abd-ur-Reza, SajasiGhidari H. [2010] Rural Development focusing on Entrepreneurship (definitions, perspectives and experiences), Samt Press, Tehran.
- [2] McKibben, Bill. [2007] Deep Economy. Holt Paperback Times Books: New York.
- [3] Kaushik, Surendra K, Kaushik S, Kaushik S. [2006] How higher education in rural India helps human rights and entrepreneurship, Journal of Asian Economics 17:29–34.
- [4] Cranwell MR et al. [2005] A Model Food Entrepreneur Assistance and Education Program: The Northeast Center for Food Entrepreneurship, Journal of Food Science Education, 21(04).
- [5] Karimi S. [2014] Rural Entrepreneurship, challenges and opportunities, Journal of Rural Entrepreneurship in Agriculture, 1(3): 101-119.
- [6] Golzari, Masud, 2007, Urban and Rural Geography, Ketabdar Press, Tehran.
- [7] Moti'iLangroodi H, Qadirimasom M, Dadvrkhany, F, Yadollahi F, Jahangir, Tarkashvand Z. [2012] Explained the effective factors on Enabling the villagers in entrepreneurship development, Journal of Research in Human Geography, 80: 119-138.
- [8] Abdullah Z, Gholam H, Kalagar P, Mahbubi, Muhammad R, AbediSarvestani A. [2014] Requirements of starting businesses in the rural areas', Journal of Rural Research and Planning, Year 3(6): 103-116.
- [9] Farahani, Hussein, Rasuli Nia, Zakiyeh, AsdaghiSarEskanrud, Zahra. [2014] Effective factors on development of Entrepreneurship in rural areas, Seasonal of Space Economy and Rural Development, Year 3(3): 1-16.
- [10] Heidari Sareban, Vakili. [2015] Studying the effective factors on success of rural job creators in Ardabil Province', Seasonal of Geography and Development, Year 11(38): 151-168.
- [11] Wendy, T, Chong, S. [2007] Theorizing a framework of factors influencing performance of women entrepreneurs in Malaysia Asia Entrepreneurship and Sustainability, (5):42-46.
- [12] Folmer H, Subrata D, Han O. [2010] Determinants of Rural Industrial Entrepreneurship of Farmers in West Bengal: A Structural Equations Approach, International Regional Science Review, 33(4):367-396, <http://irx.sagepub.com/content/33/4/367.full.pdf+html>.
- [13] Alonso N, Trillo D. [2014] Women, rural environment and entrepreneurship, Procedia - Social and Behavioral Sciences 161:149 – 155.
- [14] Kanka, S. [2003] Entrepreneurial Development, New Delhi: Chand an Company Ltd.
- [15] AhmadpurDarani, M, Moghimi M. [2010] Basics of Entrepreneurship, Farandish Press, Tehran.
- [16] Samian, Masud, Movahedi, Reza, Ansari, Elham. [2015] Studying the ways of creating small rural businesses focusing on rural Entrepreneurship, Seasonal of Agricultural Engineering System and Natural Resources, Year 13(47): 37-41.
- [17] Taghdisi A, Hashemi S, Hashemi MM. [2015] Analysis of effective elements on development of Entrepreneurship in rural areas', Seasonal of Geography and Environmental Studies, 4(14): 83-98.
- [18] Kalagar P, Aghaee M. [2014] Studying the role of agricultural Entrepreneurship in rural development, Journal of Agricultural Entrepreneurship, 1(1): 61-83.
- [19] Mehregan MR. [2004] Advanced operational survey, KetabDaneshgahi Press, Print 1, Tehran.
- [20] Najafi B, Safa L. [2014] A study of Entrepreneurial domestic businesses and obstacles and challenges on the way of their developments in rural areas', Journal of Entrepreneurship in Agriculture, 1(2):61-73.

ARTICLE

THE EFFECT OF SOUTH PARS ACTIVITIES ON THE NEIGHBORING TOWNS IN THE FIELD OF URBAN DEVELOPMENT

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ABSTRACT

The Huge oil and gas industry during his long recent history, in this country, massive and dramatic changes in the foundations of economic, social, cultural and political has created. However, despite the important role of the industry in the development of the country, develop its activities in areas of the home and the neighboring towns effects of economic, social and environmental pros and cons have been around a lot on local communities. Therefore, in this study researchers have tried to focus on South Pars oil and gas industry as the energy hub and by taking advantage of library studies and analytical – descriptive method. To identify and evaluate strengths, weaknesses, opportunity and threat posed by the oil and gas industry paid over the life of the inhabitants of the province and the neighboring towns and using SWOT analysis, several strategies for sustainable development in economic, social and cultural life of the province and the neighboring towns offered.

INTRODUCTION

In recent decades despite the economic aspects of development, everyone seems to have accepted that development is more than economic growth aside from improving the material and social justice, honor the values and traditions of indigenous covers [1]. Nevertheless, development can be considered a process that makes the living conditions unfavorable to favorable conditions [2]. Generally, industry entry to local communities caused changes in the structure of ecological, economic and social relations, livelihood and lifestyle and the people of the region. However, sometimes the officials of his attention will be focused solely on economic growth and development. This despite the fact that during the course of industrial development should not be indifferent to the changes in the local communities over community development projects near the indigenous people of the area that they neglect is that why industrial development can be considered as certain conditions was conducive to social development. In addition, its positive effects in addition to furthering the objectives of development projects, the presence of oil and gas industry in the province due to its economic potential top. On the one hand, you could create an opportunity for sustainable development of the province and the neighboring towns on the other hand in case of negligence and neglect in proper planning and comprehensive all-round development in various aspects of economic, can increase the underlying social and cultural backwardness and other problems at the regional level as well. Therefore, researchers have tried to look at the paper Careful study of the economic impact, political, social – ecological and institutional life of the oil industry in Bushehr Province. The neighboring towns paid and thereby utilize the technique and SWOT analysis a few strategies to take advantage of opportunities resulting from this lucrative industry in the Bushehr province and reduce or mitigate adverse consequences from it.

Background research

There are very significant with regard to urban development and political aspects and consequences, economic, social and cultural origins and development industries and the massive oil and gas industry in the host areas, and the neighboring town's ever-comprehensive study that simultaneously positive and negative impacts of the industry in oil-rich areas do not pay. In addition, often available with a one-dimensional look only to the few aspects of the oil industry impacts on local communities are addressed.

METHOD

In order to achieve study goals and the realization of its mission affect the neighboring towns of South Pars activities in the field of urban development. The researchers enjoying the analytical method and consideration of existing secondary data (library studies), opportunities, challenges, strengths and weaknesses of the oil-rich regions of the province based on four dimensions: political, economic, social - ecological and institutions, studied and examined. In order to analyze the information and provide effective strategies that method utilizes a comprehensive framework strategy and the study focused on the analysis of indoor and outdoor areas and a list of strengths, weaknesses, opportunities and threats it has identified in this regard, and then set priorities. In order to meet and minimize weaknesses and threats and improve existing strengths and opportunities few strategies to take advantage of opportunities arising from the presence of the oil industry in the study area and reduce negative impacts and propose it.

KEY WORDS

Urban Development, Oil and Gas Industry, South Pars

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Swat model

SWOT analysis is useful models, which is trying to form a coherent and systematic analysis of the internal and external environment to identify each of the strengths, weaknesses, opportunities and threats strategies appropriate to the time specified in such a way clear effective strategies to maximize opportunities and minimize weaknesses and strengths would be threats. Notable in this dynamic environment between properties (local and foreign) and ongoing need to review the recent developments at different times in order to extract strategies are appropriate and up to date. In fact, two fundamental issues recognizing the opportunities, threats, strengths and weaknesses in the SWOT analysis results by recognizing the distinctive merits and weaknesses of the organization and limit the option key to select the best strategy provides a useful [framework](#) [3, 4, 5].

Table 1: Improved SWOT matrix

Weaknesses(W)	Strengths (S)	Quality goals
Strategies (WO)	Strategies (SO)	Opportunities (O)
Strategies (WT)	Strategies (ST)	Threats (T)

Field of study

South Pars is the realm of research. Special Economic Energy Zone Pars (Assaluyeh) thirty-ninth session of the Supreme Council in 1998 following ratification of free trade areas - industry in order to exploit oil and gas resources and economic activities in the field of South Pars oil and gas and petrochemical industries in the area Assaluyeh and Gulf coastal area of 30 hectares was established [6].

Research findings

Table 2: External factors evaluation matrix (EFE)

Quality goals	External factors
Opportunities	O1: increase liquidity in the province and the neighboring towns
	O2: Contribute to the development of urban facilities in the province.
	O3: the government's focus on the deprivation of Oil
	O4: Employment and job creation
	O5: the development of regional infrastructure
	O6: implementation of welfare projects in the province and the neighboring city
Threats	T1: inflation and rising cost of living in these areas
	T2: environmental pollution caused by the refinery expansion
	T3: Open Drug and alcohol and other social problems in the region
	T4: serious conflicts about land ownership, land ownership practices natively by the Ministry of Oil
	T5: rural migration and an increased desire to urbanization
	T6: increasing dependence on state economies in the region

Table 3: Internal factors evaluation matrix (IFE)

Opportunities	S1: increase liquidity in the province and the neighboring towns
	S2: Contribute to the development of urban facilities in the province.
	S3: the government's focus on the deprivation of Oil
	S4: employment and creating job opportunities
	S5: the development of regional infrastructure
	W1: inflation and rising cost of living in these areas
	W2: environmental pollution caused by the refinery

	expansion
	W3: Open Drug and alcohol and other social problems in the region
	W4: serious conflicts about land ownership, land ownership practices native by the Ministry of Oil
	W5: Rural migration and an increased desire to urbanization

Table 4: SWOT matrix

Strengths (S)		Weaknesses (W)
	<p>S1: increase technical skills and knowledge of the people</p> <p>S2: to have the potential and rich natural resources</p> <p>S3: the presence of active petroleum and petrochemical industries in the province</p> <p>S4: enjoy the rich culture and the desire to do social exchange with non-Indians</p> <p>S5: improving the quality and quantity of education and public health</p>	<p>W1: Native shortage of skilled workers in the oil industry in the province</p> <p>W2: the lack of cooperation with other local organizations, oil companies in the social and economic development of the province</p> <p>W 3: reduced investment in non-oil production in the province.</p> <p>W4 lack of proper planning and a comprehensive economic, social and cultural province</p> <p>W5: Lack of amenities and leisure suits in many oil-rich provinces</p>
Strengths (O)	<p>SO strategies</p> <p>1. Developing a comprehensive program of development of oil industry in line with the socio-economic development of the region</p> <p>2. The development of petroleum and petrochemical industry related courses and training in higher education</p> <p>3. Compiling packages in order to attract investment capital to other economic sectors province</p>	<p>WO strategies</p> <p>1. The construction and expansion of facilities the welfare, health and education to enhance the welfare of indigenous</p> <p>2. Create financial incentives to attract foreign investors and the private sector in other economic sectors</p>
Threats (T)	<p>ST strategies</p> <p>1. Marine national parks and forests and other natural resort for environmental protection, tourism</p> <p>2. Implementation of projects and groups at-risk youth awareness of the negative consequences of social</p> <p>3. Development of organizational interactions between the Oil Ministry and other local organizations in order to align strategies for sustainable development</p> <p>4. Provide packages to support other local industries and jobs</p>	<p>WT strategies</p> <p>1. Increased security zone together with the implementation of the prevention of corruption in the province</p> <p>2. The reference organizations create and support organizations to solve conflicts between the oil ministry with land owners</p>

Research findings

According to what was said with regard to sources of research and theoretical studies done on this research strengths, weaknesses, opportunities and threats facing the host communities by focusing on the development of oil industry in the province (Jam, Nakhil Taqi city), Parsian and Lamard and its neighboring towns including were studied. On this basis, researchers have attempted to provide guidelines have given the following results.

A) Based on the findings of internal factors increase delves into the technical skills and knowledge of the people, improve the quality and quantity of education and public health in the province. Having a rich cultural and social exchanges with non-natives tend to be the most important internal benefits also among the weaknesses of the three cases, the lack of accurate and comprehensive planning for economic, social and cultural province. Few other local organizations working with oil companies on social and economic development of the province and the lack of amenities and leisure suits in many oil-rich provinces featured more than others.

B) The results of our study suggest that four increases in external liquidity in the province, the development of regional infrastructure, creation of employment opportunities. The government's focus on the deprivation of the oil-rich regions making up the opportunities to achieve their goal while issues such as inflation and increased cost of living in these areas, environmental pollution caused by the refinery expansion.

C) Economic impact: the presence of oil and gas in the province a chance increase the income of people in the province and the neighboring towns on the other hand, some cities, including challenges to the economy in Assaluyeh, Jam, Nakhil Taqi and Bidkhon. We have many ways of economic rents in neighboring cities Parsian and Lamerd city due to the presence of oil and gas intentionally or unintentionally destroyed. Moreover, its economy is based on oil and gas activities directly or indirectly is built. In the past, before the oil and gas projects in the region, people by sea, trade and animal husbandry paid employment; but now most of the agricultural land for the project has been capped salt and the possibility of lost agricultural and livestock area has been completely destroyed. The rout of the earth at the time of rainfall, caused salt-water intrusion in aquifers as a result, the poor, saline aquifers are underground and is very weak due to agriculture. Fishing, because of giant ships with massive nets is fishing action for local residents are almost gone. One of the main causes of air pollution is industrial wastewater evaporation of seawater in the region. However, what is clear is that revenues from oil and gas activities is not in itself a cause of backwardness and the main reason is too much reliance on this type of economy and lack of proper planning and principles for other non-oil revenues and production in other sectors.

G) Environmental impact: there is the impact on the environment of the region we have a reference area. In this area, the 5 phases of oil and gas have been working with each phase has a bright flame and a number 4 exhaust is off and this situation makes air pollution in Assaluyeh region is higher than in Tehran. [1] South Pars region due to its proximity to the sea sensitive habitats such as mangrove forests and Nayband Gulf coral reefs, estuaries and coastal marine national park Nayband. In terms of ecological, economic, social and environmental science with an emphasis on vulnerability and sensitivity, the implementing any human activity, it was risky because of the loss of any of these habitats, wildlife area (fauna and flora) were threatened and endangered. However, the law refinery projects before enforcement must obtain a permit from the Environmental Protection Agency, but in the meantime, none of the environmental warnings went unheeded. This applies to the activities of excavation and embankment, causing a sharp increase in water turbidity and destruction of coral, as the main centers of biodiversity in marine organisms (macrofauna and Mayofaunha, fish, etc.), which compares Naiband Bay map from 1998 to 2007, the degree of opacity that has increased significantly, well indicated. Persian Gulf corals were developed over millions of years and preserve them as national natural heritage purify water it is obligatory upon all. About other things, the mangroves and mud areas around estuaries Assaluyeh, which are the main centers of interest waterfowl in the area of oil pollution, development of construction activity and changing habitat conditions, as a result of uneven economic development plans. Naiband in the Gulf Coast region, including the regional environment that is intimidating others in its wake, security habitat for migratory birds and their survival, have been eclipsed. Thus, according to the relative priority of priorities and benefits associated with the oil industry in the areas and by considering the goals and vision of the government. The province's oil ministry and local authorities in order to fulfill the Vision 1404, develop a comprehensive program of development of oil industry in line with the socio-economic development of the region is the best strategy.

CONCLUSION AND RECOMMENDATIONS

In this paper, the effect of the neighboring towns of South Pars in the context of urban development examined. The reality is that the most important and most reliable source and reliance on economic and industrial development of rich oil and gas resources. Oil industry from exploration to extraction stage, transportation and sales; create employment for not only the province but also to all parts of the country.

However, should this series supporting roles in sustainable development and in the production of well-known social engineering and run to avoid losing opportunities have arisen.

1) Committees for evaluation of opportunities in non-oil producing areas have lost up and with the issue of appropriate enforcement mechanisms should be developed.

2) Health and environmental pollution caused by processes occurring in the region considered an appropriate measure to help people live better in comfort. Remedy for this is to attract the elite into the background and motivation of employees in the industry because the people who are at risk of infection, employees of Assaluyeh and the adjacent city. In many cases, the lack of resources prevents many employees is the most elite and escape.

3) in the oil producing areas of investment in other sectors will be provided. Oil income through investment in infrastructure, increase security, the growth of other industries, social and cultural development, education and human resources development and to lay the groundwork for sustainable development to be spent.

4) Besides expert opinions, views people as well as in industrial activities and programs enter to the general satisfaction and social integration will contribute to the development of better industry. The more successful because of the oil, gas and petrochemical industries in the region to contribute to people's needs better.

5) grants to education, building universities, public hospitals, technical centers for technical training of natives and their absorption in existing companies at the regional level can be achieved satisfaction of the people.

6) Do not use wells for irrigation of green spaces and towns refinery environment and we can settle it with water up to 25 km from our sea do now.

7) High planting trees reduce pollution in the city, which is a good resort for people and have clean air.

CONFLICT OF INTEREST

Authors declare no conflict of interest.

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References

- [1] Arab Shahi, Simin. [2007] Development Management, Tehran, professor.
- [2] Asadi A. [2000] Sociology of Development, Public Administration, 8.1990
- [3] Pearson R. [2002] Strategic management planning; Translation: Sohrab Khalili Shorini, dissemination Memorial Book
- [4] Sarmadi Saeedi, Soheil. [2007] Management and strategic planning in action, Tehran, Press staff
- [5] Ali Ahmadi, Alireza, Fathallah M, Taj al-Din I. [2003] Holistic approach in strategic management: approaches, paradigms, schools, processes, models, techniques and tools, Tehran, knowledge generation
- [6] Amirahmadi H. [1998] Industrial development tools, continuity and discontinuity, Tehran: Knowledge emissions.
- [7] Amirahmadi H. [1998] Industrial development tools, continuity and discontinuity, Tehran: Knowledge emissions.

ARTICLE

INVESTIGATING THE RELATIONSHIP BETWEEN TRANSFORMATIONAL MANAGEMENT STYLE AND TEACHERS KNOWLEDGE SHARING IN SCHOOLS OF MOHR CITY IN THE ACADEMIC YEAR 2016-2015

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ABSTRACT

The study aimed to investigate the relationship between transformational management style and teachers knowledge sharing in schools of Mohr city in the academic year 2016-2015. This study is applied and descriptive correlational in terms of data collection. The study population included all teachers in schools in department of education in the academic year 2016-2015 in Mohr city are taught. This population is 510 people, including 205 female teachers and 305 male teachers. In this study with tutor's number of 301 subjects (132 females and 169 males) was selected using stratified randomly. Research data using two questionnaires transformational management questionnaire Bass and Elio (2000) and knowledge sharing self-made questionnaire were collected. Validity of the questionnaire was confirmed by experts research as well as using factor analysis of the questionnaire validity 0.82 Inventory management 0.84 as well as knowledge sharing transformative confirmed. The reliability of the method using Cronbach's alpha 0.91 in the questionnaire transformational management and knowledge sharing in the questionnaire was 0.87. Data were analyzed using descriptive and inferential statistics. Study results showed that there is a significant relationship between transformational initiatives (Mental stimulation, inspirational motivation, idealized influence and individual considerations) and knowledge sharing. T test results also showed that there was no relationship between male and female teachers about transformational management style and sharing of knowledge in schools of city Mohr. Friedman test results indicated significant differences between components of research based on the results of the lowest average rating of considerations relating to the individual components and the highest average rating idealized influence is related to the component.

INTRODUCTION

Today, each organization or agency or company that most preoccupy the minds of managers to staff and the way they interact with each other on their way to one of their objectives which enhance organizational performance. A major characteristic of successful organizations that are distinguished by their organizations fail; this characteristic is leadership. "Leadership" is a subject that has long attracted researchers and the public, the reason might be that the leadership of the extensive appeal process is very mysterious that the lives of all people. In most cases, behavioral scientists have tried to understand based on what qualities, abilities, behaviors, power supplies or by relying on what aspects of leadership positions in effect on realization of the objectives of the followers of the group can be determined.

How to improve the effectiveness of training achieve the educational goals and knowledge as one of the main challenges facing managers and planners and in this regard.

Different policies applied to the change in the mechanisms of learning, is one of them, because this way we can influence the behavior and educational activities [1]. The new world requires new institutions need new leadership. In addition to the teachings of classical logic and rational leaders of the modern era, with new thinking tools based on understanding and emotional values and believed to be factors in the decision. Coordination and organizational adaptation to changing and complex environment around them is vital. This organizational change can be achieved with creativity. Organizations, for their lasting success, a success now and in the future, and serious efforts must be continuous and optimal performance and transformation through creative transformation that can be achieved. Their work epigraph [2].

In the present era increasingly wider range of knowledge and further develop their concept. The development of science and knowledge on the relationship between humans and their interactions at work in the organization and the effectiveness and efficiency of staff and development of knowledge is effective. Leadership of the person or group and not force them willingly strives to achieve the goal (or goals) in position [3]. How to use the organization's influence in the style leaders say. In terms of different patterns provided leadership Machiavelli is the first study to develop leadership traits and leadership theory to study the structure of feudal England and the definition of charisma root, it is a gift of God with power over others, which includes the trust and loyalty is achieved. Theorists such as House and Bass charisma as a transformational leadership have defined peace [4]. In contemporary literature leadership and organizational management, leadership effectiveness theory of transformational leadership is in a position to describe the processes and yet has been able to create a model for fundamental change and transformation in many of today's organizations [5]. Knowledge sharing is one of the most basic dimensions of learning organization and naturally, the implementation of knowledge sharing in organizations such as schools in any other manner should be relaxed in process step by step and the detailed program performed and compiled to create a new approach. The most important factor is creating the right conditions for growth knowledge of management style of the schools. Transformational leaders

KEY WORDS

Transformational management, knowledge sharing, mental stimulation, inspirational motivation, idealized influence, personal considerations.

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have tried to foster his collection and working with their personal interests rather than collective and organizational goals after deciding to meet. Higher incentives created their own followers and encouraging employees to act beyond their own expectations [6]. Therefore, knowledge sharing as one of the main factors in the growth of a learning organization and most important, it is applying core competencies and gain competitive advantage. People with knowledge sharing and the administrator can create opportunities to individual results and acquire and the field of knowledge management and knowledge transfer to schools to provide teachers and students and the change in management and scientific activities to create school educational organizations. This study aims to examine the relationship between transformational management style and knowledge sharing teachers in city schools what is love. Other studies have also done on the subject of the study the results of previous studies presented.

Attafar and Bahrami (2014), in a study as the use of components of learning organizations in the public and Islamic Azad University of Shahrekord based on the five components of individual capabilities, mental models, shared vision, team learning and systems thinking to do. The results showed that the use of «personal capability» in Islamic Azad University, is more than the average and the State University was at a moderate level. The use of "mental models" below the average level in both universities and the use of a "shared vision", "team learning" and "system thinking" at the Free University and the State University more than the average level were below the average level meeting [7].

Mozaffari (2013), in a study entitled investigate the relationship between organizational culture and leadership styles in universities concluded that the organizational culture of the faculty members. Faculty members believe that the workspace and the assets of these cultural properties. The tendency to stability, law and policy official, coordination and efficiency is goal-oriented. However, survey respondents of the questionnaire revealed that organizational culture ideal applications include flexibility, freedom, cooperation, development of resources - human, innovation, creativity, risk, professional growth and the acquisition of professional knowledge and skills. Data analysis revealed that effective time management skills are high between organizational culture and leadership style and management skills conformity [8]. Mirshahi (2013), research on the relationship between organizational structure and knowledge management collaborative learning Islamic university in the academic year 2012-2013 in Sirjan city has done. The study population consisted of all faculty members of Islamic Azad University, Sirjan city. The results showed that among the components of the structure formalization, centralization meaningful and more powerful predictors among the components of knowledge creation and knowledge management, the establishment of knowledge; knowledge sharing is significant and then showed a stronger predictor of student records [9].

Zare (2013) in a study entitled investigate the relationship between learning organization and management of knowledge and creativity among four area school administrators Shiraz has done. The results showed that there is a significant relationship between learning organization and creativity managers and there is not a significant relationship between its component variables thinking and team learning and managers creativity. However, there is not a significant relationship between knowledge management and creativity managers. On the other hand, among the components of a learning organization and knowledge management component just learning organization is able to predict creativity. Among its components and systems thinking and team learning predict an important loss of creativity [10].

Ayatt (2013), in a paper explain the relationship between knowledge management and organizational intelligence and organizational commitment among employees of the education department in 4 region of Shiraz has conducted. The findings show there is a significant relationship between knowledge management and organizational intelligence and organizational commitment. There is a significant positive relationship between all the aspects of knowledge management (knowledge creation, deployment of knowledge, knowledge) and knowledge sharing. But there was a significant positive correlation among all organizational (strategic vision, shared fate, appetite for change, spirit, unity and agreement) and performance pressure [11].

After registration of dimensions of knowledge management is unable to predict organizational commitment. The strategic landscape of the dimensions of organizational intelligence is able to predict organizational commitment. Knowledge management and organizational intelligence and organizational commitment are able to predict. Zhang et al (2014), in a study entitled linking transformational leadership and group performance of a conflict management approach to enhance coordination group concluded that transformational leadership as a result, group performance by encouraging groups to adopt a collaborative approach to conflict resolution rather than approach the competition. In addition, the transformational leadership can help group members to manage conflict in a way that benefits all people have sought help. Aware of the fact that conflicts can be prevented achieving the organization goals, necessary to make this inevitable phenomenon within the organization of the different aspects examined thereby enhanced the awareness of managers of the conflict. Given the key role of education organizations considered that, any development since the schools according to the human development and behavioral sciences at the school of motivation has emerged. The relationship between these two components of schools must be examined [12].

Lia et al (2013), in his work examined the relationship between knowledge sharing and Taiwan's ability to absorb knowledge in knowledge-based organizations. They collected data from about 170 organizations in

the insurance industry knowledge, E-service units were collected and the results found that sharing and distribution of knowledge in this industry a positive impact on their ability to absorb knowledge and workers to absorb new knowledge and information to knowledge and encourages innovation in organizations [13].

Hoffman (2007), in a study entitled Does your sense of humor and balances the leadership style and conflict management styles? It concluded that a positive relationship between transformational leadership style and sense of humor are exchangeable and a significant positive relationship between transformational leadership style and conflict management style is conciliatory. This relationship will promote a sense of humor. In addition, a significant positive correlation between laissez-faire leadership style and conflict management style is to avoid that sense of humor as well to promote this relationship is improving. Regression analysis shows that with increasing sense of humor and transformational leadership behaviors declines have preferred to maintenance of avoiding conflict management.

Research main hypotheses

(A) The main hypothesis: there is a significant relationship between the transformational management style and knowledge sharing among teachers in schools of Mohr city.

(B) Research special hypotheses

1. There is a significant relationship between the mental stimulation and sharing of knowledge among teachers in schools of Mohr city.
2. There is a significant relationship between inspirational motivation and knowledge sharing among teachers in schools of Mohr city.
3. There is a significant relationship between idealized influence and knowledge sharing among teachers in schools of Mohr city.
4. There is a significant relationship between individual considerations and knowledge sharing among teachers in schools of Mohr city.

METHOD

The aim of this study was to investigate the relationship between transformational management style and knowledge sharing teachers. This study is applied and how data collection is descriptive and correlational. The study population included all teachers of Department of Education in schools in Mohr city in the academic year 2016-2015 are taught. Research data using two Bass and Elio (2000) transformational management questionnaire and knowledge sharing self-made questionnaires were collected. Validity of the questionnaire was confirmed by experts research as well as using factor analysis of the questionnaire validity 0.82 transformational management 0.84 questionnaire was confirmed as well as knowledge sharing. The reliability of the method using Cronbach's alpha 0.91 in the transformational management questionnaire and in the knowledge-sharing questionnaire was 0.87. Data were analyzed using descriptive and inferential statistics.

Research findings

The main hypothesis: there is a significant relationship between the transformational management style and knowledge sharing among teachers in schools of Mohr city.

Table1: The correlation coefficient between transformational management style and teachers knowledge sharing

Variables	Correlation coefficient	p-value
Transformational management	0.415	0.000
Knowledge sharing		

The results indicated that there is a significant relationship between the transformational management and sharing of knowledge among teachers in schools of Mohr city. This factor has a positive creativity and the correlation coefficient is 0.415. This result means that the linear relationship between two variables is direct and is expected; implementing transformational initiatives is the development of knowledge sharing school's teachers. The hypothesis of the study has been approved and it can be said that there is a significant relationship between transformational management style and knowledge sharing among teachers in schools of Mohr city.

The first hypothesis of the research: There is a significant relationship between the mental stimulation and sharing of knowledge among teachers in schools of Mohr city.

Table 2: The correlation coefficient between mental stimulation and teachers knowledge sharing

Variables	Correlation coefficient	p-value
Mental stimulation	0.373	0.000

The results indicated that there is a significant relationship between mental stimulation and sharing of knowledge among teachers in schools of Mohr city. This factor has a positive creativity and the correlation coefficient is 0.373. This result means that the linear relationship between two variables is direct and is expected; implementing transformational initiatives is the development of knowledge sharing school teachers. The hypothesis of the study has been approved and it can be said that there is a significant relationship between mental stimulation and knowledge sharing among teachers in schools of Mohr city. The second hypothesis of the research: There is a significant relationship between inspirational motivation and knowledge sharing among teachers in schools of Mohr city.

Table 3: The correlation coefficient between inspirational motivation and teachers knowledge sharing

Variables	Correlation coefficient	p-value
Inspirational motivation	0.407	0.000
Knowledge sharing		

sults indicated that there is a significant relationship between inspirational motivation and sharing of knowledge among teachers in schools of Mohr city. This factor has a positive creativity and the correlation coefficient is 0.407. This result means that the linear relationship between two variables is direct and is expected; implementing inspirational motivation is the development of knowledge sharing school's teachers. The hypothesis of the study has been approved and it can be said that there is a significant relationship between inspirational motivation and knowledge sharing among teachers in schools of Mohr city.

The third hypothesis of the research: There is a significant relationship between inspirational motivation and sharing of knowledge among teachers in schools of Mohr city.

Table 4: The correlation coefficient between inspirational motivation and teachers knowledge sharing

Variables	Correlation coefficient	p-value
Idealized influence	0.396	0.000
knowledge sharing		

The results indicated that there is a significant relationship between idealized influence and sharing of knowledge among teachers in schools of Mohr city. This factor has a positive creativity and the correlation coefficient is 0.396. This result means that the linear relationship between two variables is direct and is expected; implementing idealized influence is the development of knowledge sharing school's teachers. The hypothesis of the study has been approved and it can be said that there is a significant relationship between idealized influence and knowledge sharing among teachers in schools of Mohr city.

The fourth hypothesis of the research: There is a significant relationship between idealized influence and sharing of knowledge among teachers in schools of Mohr city.

Table 5: The correlation coefficient between personal considerations and teachers knowledge sharing

Variables	Correlation coefficient	p-value
personal considerations	0.363	0.000
knowledge sharing		

The results indicated that there is a significant relationship between personal considerations and sharing of knowledge among teachers in schools of Mohr city. This factor has a positive creativity and the correlation coefficient is 0.363. This result means that the linear relationship between two variables is direct and is expected; personal considerations are the development of knowledge sharing school's teachers. The hypothesis of the study has been approved and it can be said that there is a significant

relationship between personal considerations and knowledge sharing among teachers in schools of Mohr city.

CONCLUSION

This study examines the relationship between transformational management style and knowledge sharing in schools of Mohr city. The research to conduct component (intellectual stimulation, inspirational motivation, idealized influence and individual considerations) as transformational aspects of management in order to share knowledge and explore the teachers in the schools surveyed. Study results showed that there is a significant relationship between transformational initiatives (intellectual stimulation, inspirational motivation, idealized influence and individual considerations) and knowledge sharing. T test results also showed that there was no relationship between male and female teachers about transformational management style and sharing of knowledge in schools of Mohr city. In addition, Friedman test results indicated significant differences between components are research based on the results of the lowest average rating of considerations relating to the individual components and the highest average rating idealized influence is related to the component.

SUGGESTION

Teachers' lack of confidence in the capabilities of hypothyroidism is caused due to the lack or shortage of competency. Therefore, it is suggested that schools create an atmosphere of mutual trust between teachers and administrators of increasing trust provided. Considering the capabilities of teachers will be provided in the context of the development of mutual trust and managers can create suitable infrastructure in schools to improve organizational goals and science teachers' knowledge and capabilities through the flat structure, cross the structure and reduce the number of layers. Levels of management in the structure (delegating more) knowledgeable teachers the ability to share knowledge and achieve greater efficiency and according to aid the learning organization components.

As well as training courses for executives to learn about and applying appropriate factors for increasing teachers' competence and the founding of change management and systems thinking and encourage entrepreneurs to create businesses. Moreover, sharing knowledge is required to establish a learning organization in schools and according to the results of the study suggest that the scientific databases and information education departments and schools. The latest scientific research and technological research and transfer teachers created.

CONFLICT OF INTEREST

Authors declare no conflict of interest.

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References

- [1] Macpherson M. [2011] Performance excellence principles, *Journal Of Managerial Psychology*. 24(3): 12-25.
- [2] Sadeghi N,Zare, H. [2009] the impact of the funding on improving the performance of hospitals, *Quarterly Monitor*, 2:135-145.
- [3] Jafari M. [2004] Organizational learning at the level of individual, group, organization, The second International Conference on Management, Sharif University
- [4] Mooghali, AR. [2003] Design pattern of transformational leadership in organizations, *knowledge management*, 62: 24-31.
- [5] Hashemi Seyed A, Khajehpoor K. [2015] *Principles of Management*, Publications Taimaz
- [6] Hashemi SA. [2013] to investigate the use of the components of a learning organization Lamerd city elementary schools in primary schools Lamerd city. Management Conference and challenges Azad University of Shiraz.
- [7] Attafar, Ali Bahrami M. [2014] Investigate the use of the components of the learning organization in state-run universities and Islamic Azad University master's thesis, Shahrkorrd Islamic Azad University Branch.
- [8] Mozaffari, Amin. [2013] Examine the relationship between organizational culture and leadership styles in university master's thesis, University of Qazvin.
- [9] Mirshahi A. [2013] Relationship between organizational structure and knowledge management collaborative learning among teachers of Islamic Azad University, Master's thesis
- [10] Zareh S. [2013] The relationship between learning organization and knowledge management, creativity, Master's Thesis
- [11] Ayat, B. [2013] F investigates the relationship between knowledge management and organizational intelligence and organizational commitment among the employees of the four Shiraz, senior thesis
- [12] Zhang X , A cao Q, Tjosvold D. [2001] Linking Transformation Leadership , *Journal of Business Research* , 6:233-2444.
- [13] Liao O S H Fei WN, Chen CC. [2013] Knowledge sharing Absorptive Capacity and innovation Capability . *Journal of information science* . 33(3): 340-356.

ARTICLE

THE RELATIONSHIP BETWEEN ORGANIZATIONAL CULTURE AND KNOWLEDGE MANAGEMENT IN NURSING SYSTEM AT HOSPITALS OF IRANSHAHR CITY

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ABSTRACT

The main advantage of today's organizations is knowledge. Knowledge is a powerful tool that is developing and changing day-to-day, and knowledge control and management requires supporting and improving the organizational culture. Thus, paving the way for implementation of Knowledge management systems in the sense that makes members of the organization ready to cooperate in the implementation of Knowledge management plans are extremely important. The present study is applied in purpose and cross-sectional in terms of administration. The target population included all nurses in hospitals affiliated to Medical University of Iranshahr, which were estimated 134 nurses. The sample size was determined using Cochran formula and simple random sampling as 110 nurses. Data were collected through survey using the standardized knowledge management scale by Perust et al. and Organizational Culture Scale by Daniel Denison; also, the reliability and validity of the two were confirmed. The results of testing the hypotheses showed a significance relationship between Organizational Culture and knowledge management. Also, the generalization of data was good and indicated the significance of all components of organizational culture (Participation culture, compatibility culture, adaptability culture, responsibility culture) with knowledge management. Promoting the dimensions of organizational culture to facilitate knowledge management cycle is recommended to managers and decision-makers of University of Medical Sciences and the hospitals.

INTRODUCTION

Today, knowledge is an integral part of the success of organizations. If the process of change and evolution of knowledge is closely assessed in contemporary society, the conclusion is drawn that the present postindustrial society is an information-based society where power-oriented technology is gradually replaced by knowledge oriented technologies. In today's dynamic and complex environment, it is essential for organizations that constantly employ the new knowledge in the form of: establishing credibility and use in their products and services. In this context, Peter Drucker says: "the secret of success in the 21st century is knowledge management." So the concept of knowledge management is more important than the knowledge itself, it seeks to explain and clarify the way individual and organizational information is transformed to Individual and group knowledge [1]. Understanding the real role of knowledge in organizations helps to find an answer to the question of why some organizations are always successful. Understanding what factors contribute to the survival of an organization and bring a lively existence for it, is closely related to the concept of knowledge and how it's used in the organization [2]. Thus, having the natural resources cannot be just as important as knowledge. Knowledge-based organization achieves capabilities that enable it to make a great strength of a little power. Knowledge management is a new effort of the century—known as the era of knowledge—to preserve, guide, and increase the knowledge investments of the organizations and points that investment in science is the best and most profitable way [3]. Knowledge management is the process of knowledge creation, knowledge acquisition, knowledge storage, knowledge dissemination, knowledge sharing and finally, the application of knowledge. An organization needs to identify, acquire and storage the knowledge it requires to be able to use it when needed. The purpose of knowledge management in the organization is its condition in terms of attention, collection, preservation and dissemination of its required knowledge [4]. Hence, knowledge management includes the processes of creating knowledge, crediting knowledge, shaping it, and distribution and scientific application of knowledge in the organization [5]. Knowledge management by creating the necessary processes to identify and capture data, the required information and knowledge about internal and external environment and transferring them into important decisions and actions of organizations and individuals has a big share in system feedback [6]. Furthermore, the organizational culture is one of the most important elements of any organization which is associated with feeling, thought, and work of personnel and any speech, opinion and behavior takes its direction [7].

Organizational culture is the dominant behavioral pattern between people in an organization that is formed based on values, beliefs, and habits of people and will be supported by the majority of people. It is influenced by factors such as monitoring, control, communication, participation, conflict, cooperation, respect for social values, etc [8].

Denison considers organizational culture as an application for determining the values, beliefs, assumptions and common practices in the organization that shapes and guides the attitude and behavior of members in the organization [9]. According to Edgar Schein organizational culture is shaped in response to two challenges every organization faces: the stability and integrity of the outer and survival and the

KEY WORDS

Knowledge management, organizational culture, nurse

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unity of inner. The stability and integrity of the outer refers to the organization's situation in the environment, how can that organization face environmental changes [10]. By reviewing, modifying and creating an organizational culture that is flexible and appropriate, the pattern of interaction between people in the organization can be gradually changed and knowledge management can be used as a competitive advantage [11].

So given that today the world's most important feature is change, organizations are forced to rely on members as their most important asset and encourage them to understand, comprehend and provide new ideas and knowledge and to practically use the ideas for the objectives of organization. This activity requires that organizational culture is educating and supports knowledge-based activities as an important constituent of organizational character and behavior of personnel.

Also in this century due to changes in health care systems, organizations have many challenges such as increased costs and financial pressures, increased customer awareness, competitive markets, improving the quality, and cost effectiveness of the services. These changes need to increase of knowledge and information sharing and knowledge management techniques. The most important obstacle of an effective implementation of knowledge management is lack of culture of sharing knowledge and lack of understanding the myriad benefits of knowledge management among employees. Research also shows that knowledge-based culture, that includes values and beliefs of members of the organization in relation to the concepts of information and knowledge is the most important factor in the success of knowledge management. So, officials in the fields of health care can benefit from knowledge management tools to transform hospitals to learning hospitals and take an effective step for obtaining the required capabilities for this type of organizations. In the present study, the researcher intends to investigate the organizational culture among nurses working at hospitals of Iranshahr city; and then assess its relationship with knowledge management. Since these hospitals seek major developments in their level, results can provide the grounds for implementation and improvement techniques of excellence and organizational promotion in the hospital and improving its function.

Knowledge management

Theoretical definition: knowledge management refers to establishing the processes necessary to identify and capture data, information and knowledge that an organization needs from internal and external environment and transfer them into decisions and actions of organizations and individuals [11].

Operational definition: In this study, knowledge management refers to the situation of an organization in terms of collecting, preserving, and disseminating the knowledge it requires which are assessed using knowledge management building blocks model by Perust et al. Its components include the following [7]:

1. Set the goals of knowledge: The aims of knowledge management should be derived from the main goals of the organization.
2. Identify knowledge: Understanding the sources of knowledge within and outside the organization.
3. Acquire knowledge: knowledge must be acquired from the identified resources at this stage (domestic and foreign markets).
4. Development and improvement of knowledge: the ways which contribute to the richness and promoting knowledge in organizations; including its support for the research institutions, human resource development and employing knowledgeable people.
5. Dissemination of knowledge: transfer knowledge in the interaction and communication between people.
6. Use of knowledge: to actualize the acquired knowledge and implementing knowledge in the organization.
7. Maintenance of knowledge: to selected the knowledge in accordance with objectives and save them in a way that is accessible, and to update them.
8. Knowledge assessment: the possibility of measuring the level of knowledge that will promote knowledge

Organizational culture

Theoretical definition: a system of common understanding among the members of an organization; this feature makes distinction among two organizations [12]. Operational Definition: In this research, organizational culture refers to the dominant atmosphere of the studied organization that is measured using a questionnaire by Daniel Denison. Its components include involvement, consistency, adaptability and mission of the organization.

Involvement

This index refers to capability development, sense of ownership, and accountability in people.

Consistency

Theoretical definition: the values and systems that are the basis of a strong culture. Operational definition: those employees who respect to the values of the organization and follow strong and ideal organizational

culture have the power of consistency. In Denison questionnaire, the variables related to consistency include: core values, agreement, coordination and integration.

Adaptability

Theoretical definition: translating the demands of the business environment to operation. Operational definition: organizations have the ability of to adapt to their customer needs and service requirements, through the acquisition of new knowledge and change. In this study, the adaptability consists of three components of organizational learning, customer focus, and creating change in Denison Organizational Culture Survey.

Mission

Theoretical definition: a significant long-term direction for the organization [12] operational definition: the mission of any organization, in fact, is the primary cause of and the reason for its establishment. The mission of organization is the main and unique destination that distinguishes an organization in terms of type, scope of operations, product and market and the customers from other organizations. The mission (general objectives of organization) expresses the values, aspirations and philosophy of the organization. In this study, the mission is measured using Daniel Denison survey which includes the components of the vision, goals and objectives, strategic direction and intent.

Theoretical framework

Nonaka explains the difference of organizations by means of management mental elements, such as management vision, system of values and commitment of staff. This is despite the fact that many management thinkers have avoided addressing the human mentality. For example, Simon (1945) emphasized that the actual assumptions must be separated value assumptions so that management becomes a science. So, as Flyvbjerg (2001) states social sciences are essentially different from natural sciences based on the need to address the mental affairs such as values, background and strength. Hence social science research cannot be assumed independent of subjective factors [13]. So, knowledge management process rarely can be used as a causal normative model. Since knowledge is mentally active in nature and involves commitment and belief that are deeply rooted in the value system [14]. In a study by Shirvani et al. on the subject of the rule of knowledge management processes carried out at the University of Medical Sciences, results showed that identification, acquisition, development, sharing, distribution, use and storage of organizational knowledge and its application with modern management tools such as knowledge management, has empowered the organizations in competitive conditions, and provided the preliminaries for their success. In a study by Tabibi et al., the principles of knowledge management in hospitals of Iran University of Medical Sciences were examined and findings showed that attention to the spread of knowledge, assessment of knowledge, application of knowledge, knowledge sharing and creation of knowledge is necessary. In a study by Sadoughi et al. titled as process-driven organizational memory model, a prerequisite for the implementation of knowledge management in the medical documents department, results showed that workers will have better performance if required knowledge and information is provided. In this research, the collection of variables and entities required for an organizational activity-based storage system was introduced as a means of conducting Knowledge management in the medical records departments. Karami et al. studied the application of knowledge management in clinical coding in health care organizations. Results showed that identifying and use of knowledge management tools can improve organizational performance [15]. Ahmadi et al. compared the existing organizational culture in Isfahan University of Medical Sciences with the desirable condition. Their results showed that a significant difference existed between the current and desired elements of organizational culture. Therefore, institutional and policy reforms related to knowledge management was proposed. Also, in a study by Jafar Jalal et al., that investigated the correlation among nurses' perceptions of their organizational culture and their performance in patient safety in hospitals of Babol University of Medical Sciences. The findings showed that optimization of organizational culture by the managers and officials in hospitals can improve the performance of nurses in the field of patient safety. In another study by Ahmadian et al. titled as the organizational culture from the perspective of nurses in selected hospitals of Tehran University of Medical Sciences, findings showed that organizational culture from the perspective of nurses is at a level that may reduce their performance. Hence, optimizing organizational culture to increase nurses' incentives and to improve their performance in providing high quality services is necessary.

HYPOTHESIS

The main hypothesis

There is a relationship between organizational culture and knowledge management system in the hospitals of Iranshahr.

Secondary Hypotheses

1. There is a relationship between involvement and knowledge management among the nurses working in hospitals of Iranshahr.

2. There is a relationship between culture of consistency and knowledge management among the nurses working in hospitals of Iranshahr.
3. There is a relationship between culture of compatibility and knowledge management among the nurses working in hospitals of Iranshahr.
4. There is a relationship between culture of mission and knowledge management among the nurses working in hospitals of Iranshahr.

RESEARCH CONCEPTUAL MODEL: (RESEARCHER-BUILT)

This study is cross-sectional in administration and applied in purpose. The target population included all nurses of hospitals affiliated to University of Medical Sciences of Iranshahr (n=134). Sample size was determined using Cochran formula and simple random sampling as 110 individuals.

$$n = Nz^2$$

$$p \cdot (1 - p)z^2 + Nd^2 p \cdot (1 - p)$$

(N= 136; number of nurses in different wards of hospitals), (n= 110, sample size), (P = 0.5)-(Z0.95 for level of sig. 95%- 1.96), (d precision, if the value is 5% the figure d=0.05 enters)

Data collection was done through survey method using a standard questionnaire with confirmed reliability and validity. To investigate KM the building blocks of knowledge management model of Proust et al., and for organizational culture Daniel Denison model is used.

Organizational Culture Survey: the questionnaire was developed by Denison in 2000. The number of questions in the questionnaire consisted of 60 questions in based on a 5 degrees Likert scale (from strongly disagree to strongly agree). Questions 1 to 15 refer to culture of involvement including: empowerment, team-building, developing capabilities; 16-30 refer to cultural compatibility component, including core values, agreement, coordination and integration, 31 to 45 refer to components of culture of adaptability, including: creating change, customer focus, organizational learning; and 46-60 refer to cultural mission component including: strategic direction, goals and objectives, vision [16]. Shirin has estimated the validity of the questionnaire in Iran as 82.5% Cronbach's alpha [17].

Cvr:0.82.5 The index of content validity ratio (the most important and most accurate content)

Cvi:0.84 The index of content validity (selecting tool items in the best possible way)

Table 1: Cronbach's alpha coefficient of components of organizational culture

	Involvement	Consistency integration	and Adaptability	Mission	Total
Cronbach's alpha	84%	74%	87%	85%	82.5%

Knowledge management questionnaire: This questionnaire contains 21 questions based on 5 degrees Likert scale, and measures 8 elements of Knowledge management. Questions 1 and 2 refer to set the goals of knowledge, question 3, 4, and 5 to identifying Knowledge, questions 6 and 7 to acquiring knowledge, questions 9,8 and 10 to knowledge development, questions 11 -14 to knowledge sharing, questions 15 and 16 to use of knowledge, questions 19,18,17 to maintenance of knowledge, and questions 20 and 21 to knowledge assessment. Galvani (2008) in their study calculated the reliability of the questionnaire through Cronbach's alpha as 94% [18]

Cvr:0.84 The index of content validity ratio (the most important and most accurate content)

Cvi:0.86 The index of content validity (selecting tool items in the best possible way)

For data analysis through correlation (regression analysis) SPSS software was used. First, demographic variables such as age, sex, education level, work experience, and employment type were reviewed in frequency tables and figures; and then the questions and hypotheses were examined to find the relationship between variables. In this research, organizational culture and knowledge management aspects were the independent variable and knowledge management was the dependent variable.

RESULTS

There is a relationship between involvement culture and knowledge management among the nurses working in hospitals of Iranshahr. This hypothesis is tested using Spearman correlation at $\alpha=0.05$. The p value is less than alpha, so: the hypothesis of no correlation between culture of involvement and knowledge management among the nurses working in hospitals of Iranshahr is rejected. The correlation coefficient was obtained for involvement culture and knowledge management as 0.445, i.e. a significant direct relationship exists between involvement culture and knowledge management among the nurses working in hospitals of Iranshahr. [Table 2]

Table 2: Results of Spearman correlation test between culture of involvement and knowledge management among nurses of Iranshahr hospitals

Variable	Mean	Sd	r	p
Involvement culture	50.61	8.891	R= 0.0445	P= 0.000
Knowledge management	60.573	13.769		

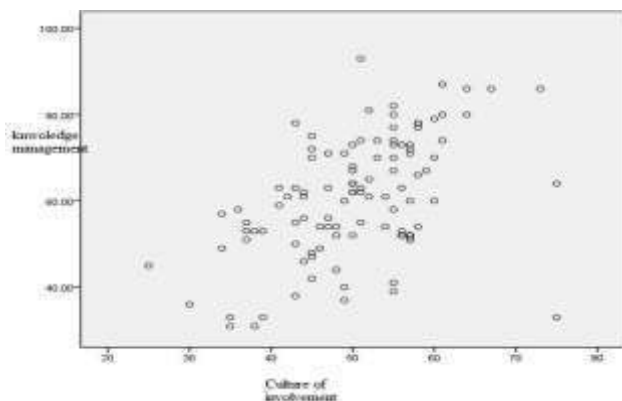


Fig. 1: The correlation diagram between culture of involvement and KM

There is a relationship between culture of consistency and knowledge management among the nurses working in hospitals of Iranshahr. This hypothesis is tested using Spearman correlation at $\alpha=0.05$. The p value is less than alpha; so, the hypothesis that no correlation exists between culture of consistency and knowledge management among the nurses working in hospitals of Iranshar is rejected. The correlation coefficient was obtained for culture of consistency and knowledge management as 0.607, i.e. a significant direct relationship exists between culture of consistency and knowledge management among the nurses working in hospitals of Iranshahr. [Table 3]

Table 3: the results of Spearman correlation test between culture of consistency and KM among nurses of Iranshahr hospitals

Variable	Mean	Sd	r	p
culture of consistency	47.65	8.749	R= 0.607	P= 0.000
Knowledge management	60.573	13.769		

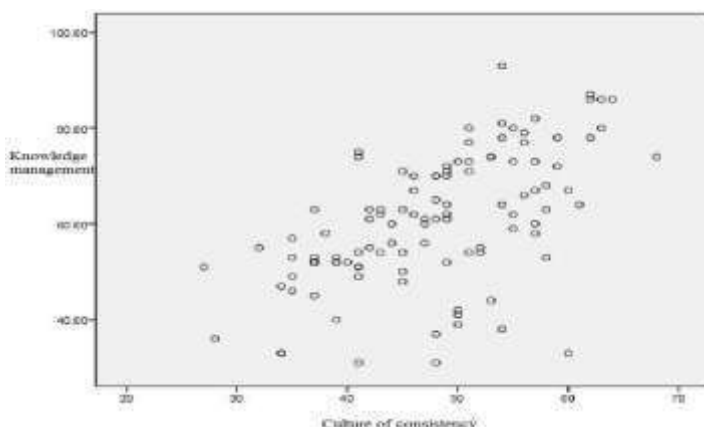


Fig. 2: The correlation diagram between culture of consistency and KM

There is a relationship between culture of adaptability and knowledge management among the nurses working in hospitals of Iranshahr. This hypothesis is tested using Spearman correlation at $\alpha=0.05$. The p value is less than alpha, so: the hypothesis of no correlation between culture of adaptability and knowledge management among the nurses working in hospitals of Iranshar is rejected. The correlation coefficient was obtained for culture of adaptability and knowledge management as 0.492, i.e. a significant direct relationship exists between culture of adaptability and knowledge management among the nurses working in hospitals of Iranshahr. [Table 4]

Table 4: The results of Spearman correlation test between involvement culture and knowledge management among nurses of Iranshahr hospitals

Variable	Mean	Sd	r	p
culture of adaptability	49.87	9.632	R= 0.0492	P= 0.000
Knowledge management	60.573	13.769		

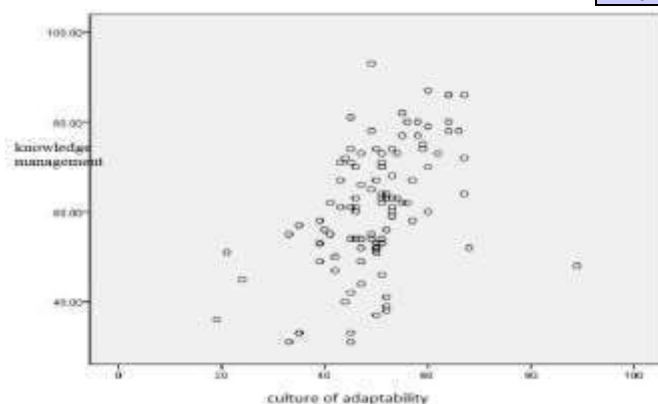


Fig. 3: the correlation diagram between culture of adaptability and KM

There is a relationship between culture of mission and knowledge management among the nurses working in hospitals of Iranshahr. This hypothesis is tested using Spearman correlation at $\alpha=0.05$. The p value is less than alpha, so: the hypothesis of no correlation between culture of mission and knowledge management among the nurses working in hospitals of Iranshar is rejected. The correlation coefficient was obtained for culture of mission and knowledge management as 0.60, i.e. a significant direct relationship exists between culture of mission and knowledge management among the nurses working in hospitals of Iranshahr [Table 5]

Table 5: the results of Spearman correlation test between culture of mission and KM among nurses of Iranshahr hospitals

Variable	Mean	Sd	r	p
Culture of Mission	47.75	10.699	R= 0.600	P= 0.000
Knowledge management	60.573	13.769		

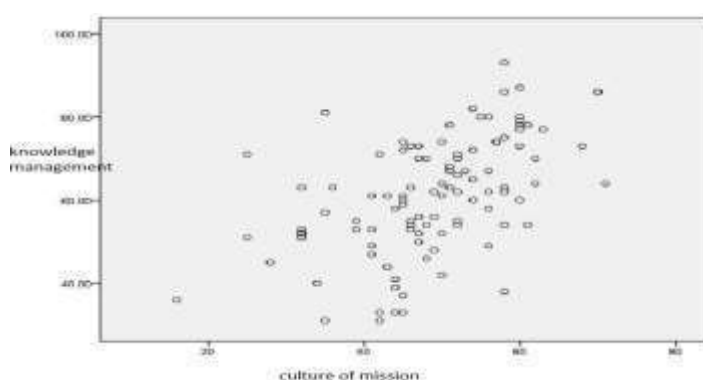


Fig. 4: The correlation diagram between culture of mission and KM

The main hypothesis

There is a relationship between organizational culture and knowledge management in the nursing system in hospitals of Iranshahr. This hypothesis is tested using Spearman correlation at $\alpha=0.05$. The p value is less than alpha; so, the hypothesis of no correlation between organizational culture and knowledge management in the nursing system at hospitals of Iranshar is rejected. The correlation coefficient was obtained for organizational culture and knowledge management as 0.620, i.e. a very significant direct relationship exists between organizational culture and knowledge management in nursing system at hospitals of Iranshahr. [Table 6]

Table 6: Spearman correlation test for organizational culture and KM in nursing system of Iranshahr hospitals

Variable	Mean	Sd	r	p
organizational culture	195.873	31.865	R= 0.0.620	P= 0.000
Knowledge management	60.573	13.769		

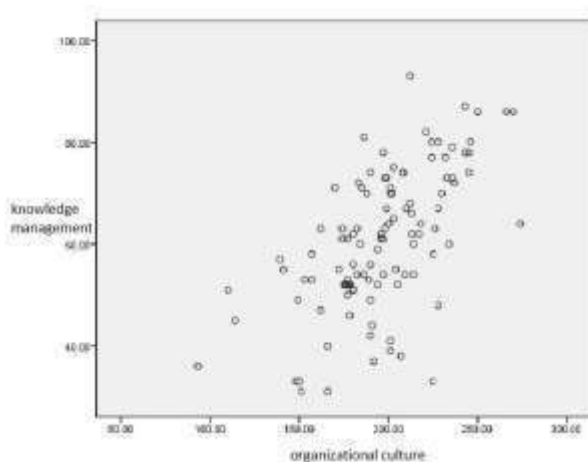


Fig. 5: The correlation diagram between organizational culture and KM

DISCUSSION AND CONCLUSION

The present study was aimed at investigating the relationship between organizational culture and knowledge management in nursing system of Iranshahr hospitals. However, the results obtained from the questionnaires showed that, in the main hypothesis the organizational culture and knowledge management has a significant direct relationship. Also, test results show the significance of all components of culture of the organization (culture of involvement, the culture of consistency, the culture of adaptability, culture of mission) with knowledge management. The generalizability of findings was found to be good. The findings of Hussein Gholizadeh (2004) showed that 50.5% of changes in Knowledge management is explained by the organizational culture, and the aspects of organizational culture is effective on successful knowledge management. In another study at the educational units, results showed that team morale and cohesion (culture of involvement) is effective on knowledge sharing [9]. And in the Ghorbanzadeh et al. (2008) results show that the organizations that are interested in using the benefits of knowledge management should pay more attention to organizational culture, managers support, organizational structure, human resources and technology management to work in coordination with the knowledge management system [19].

As the results of this study indicate, organizational culture plays a significant role in the creation and development of knowledge management; and knowledge creation can be developed quickly in the hospitals. As Nonaka et al. expressed in Organizational Knowledge Creation cycle, sharing knowledge is the first step in the process of knowledge management and basically knowledge management plays an important role in the success of an organization [20].

The obtained results in this study points that knowledge management cannot be defined as information management or data processing. Knowledge management is essentially a human and social process which is of course facilitated and possible through technical and technological approaches [21]. The results show organizational culture has the greatest impact on knowledge management. According to Prabest and Rumhardt (1950) access to tools alone cannot guarantee knowledge management; thus, organizational culture can be useful in encouraging people to volunteerly knowledge management [22]. Gu 2002, Rawli, 2002, Soleman and Spooner, 2000; Dilong and Fehi, 2000; Swibi and Simon, 2002; Vanger, 2003; Vanrog 1998; Dale and Garison, 1998; Counter, Austin, and Juck, 1992; Renzel, 2006; Brink, 2001; and Young and Wun, 2003 agree that organizational culture based on trust can encourage people to interact and manage knowledge with others [23].

In view of the above findings, it can be concluded that knowledge management as an organizational strategy requires the support of organizational culture rather than technical support. Hence, paving the way for the establishment and implementation of the Knowledge management system in the sense that makes members of the organization ready to cooperate in the implementation of knowledge management is very important. Effort to promote organizational culture dimensions (culture of involvement, culture of consistency, culture of adaptability and the culture of mission) to facilitate knowledge management cycle is recommended to managers and decision-makers of medical universities and hospitals. The findings of this study can be applicable to organizations, especially hospitals that want to gain competitive advantage and the benefits of knowledge management in the current turbulent and complex world.

CONFLICT OF INTEREST

Authors declare no conflict of interest.

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REFERENCES

- [1] Ahuiee M. [2013] Review of implementation of knowledge management process in Zahedan University of Medical Sciences. Master's thesis. Islamic Azad University, Science and Research.
- [2] Davenport T, Prusak L. [2000] knowledge management translated by Rahmanseresht, Tehran, Sopko.
- [3] Alvani SM, Danaeefard, H. [2001] speeches in the philosophy of government agency theory Tehran, Safar Publishing, 1st ed.
- [4] Zarei M, Hassan. [2000] Human Resource Management, Qom Seminary Publications Center.
- [5] Etemadian, M et al. [2008] excellence of hospital based on EFQM model. Tehran: Vajepardaz, 1st ed.
- [6] Gholizadeh Hussain, Rizwan. [2004] Survey of Knowledge Management at the University of Ferdowsi based on Nonaka's theory and its relation to cultural Organization. Master's thesis. Ferdowsi University of Mashhad.
- [7] Bhatt D, Ganb. [1998] Knowledge management in organizations. Translation: Iranshahi, Muhammad. Tehran, Journal of Science and Informatics.
- [8] Ostad Hasanlu, Hussein. [2011] Investigating the relationship between organizational culture and desire for quality assessment in Social and behavioral science departments of Tehran University, Faculty of Psychology and Educational Sciences
- [9] Denison. [2006] Organization Culture And Effectiveness. Available At [Http:// WwW.tnellent/ Organization Culture.Pdf](http://www.tnellent/ Organization Culture.Pdf).
- [10] Schein Edgar H. [2004] Organizational Culture And Leadership. Sanfrancisco: John Wiley And Sons, Inc.
- [11] Abdorrahmani, Reza. [2009] Introduction to informal organziatioal culture of Police. Journal of Police Studies. 9 (3):31-58
- [12] Parsaeian Ali, Arabi SM (Translators). [1999] An introduction to organizational behavior. Volume III, by Stephen Robbins, Tehran: Office of Cultural Research.
- [13] Nonaka I, Toyama R. [2005] The Knowledge-Creating Theory Revisited: Knowledge Creation As A Synthesizing Process. Knowledge Management Research & Practice 1: 2-10
- [14] Nonak, I, Toyama R, Konno N. [2000] Seci, Ba And Leadership: A Unified Model Of Dynamic Knowledge Creation. Long Range Planning, 33(1): 5-34.
- [15] Karami M. [2005] Examining the relationship between organizational culture and knowledge management deployment in Bahman automotive group: Behman Automobile Center Master's thesis: Tehran University, Faculty of Psychology and Educational Sciences.
- [16] Denison DR. [2000] Organizational Culture: Can It Be A Key Lever For Driving Organizational Change? International Institute For Management Development, Denison@Imd.Chapter2.
- [17] Shirin Ali. [2002] The relationship between organizational culture and organizational structure in Management and Planning Organization, the thesis Master of Public Administration, former State Management Training Center.
- [18] Galvani M. [2008] Examining the relationship between organizational culture and knowledge management in Iran Khodro Company. Master's Thesis, Department of Management and Accounting, Allameh Tabatabaei University.
- [19] Ghorbanzadeh, Vajhollah. [2008] organizational learning and learning organization with a view to knowledge management. Tehran: Baztab.
- [20] Nonaka, I, Toyama, R And Nagata, A. [2000] A Firm As A Knowledge-Creating Entity: Anew Perspective On The Theory Of The Firm. Industrial And Corporate Change, Oxford, March, 9(1): 1-20
- [21] Salyz, Edward, Jones, Gary. [2008] Knowledge management in educational organizations. Translated by M Ahanchian and R Hosseingholi Zadeh, Tehran: Institute for Education Studies
- [22] Delong D W And L Fahey. [2000] Diagnostic Cultural Barriers To Knowledge Management Academy Of Management Executive, 14(4).
- [23] Brink, P. [2001] Measurement of Conditions For Knowledge Sharing. Published In: Proceedings 2nd European Conference On Knowledge, Bled.

ARTICLE

A COMPARATIVE STUDY OF CONTINUOUS NURSING EDUCATION SYSTEM IN IRAN AND AMERICA

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ABSTRACT

Introduction: Continuous nursing education (CNE) systems in different countries are various. The study of different structures can be very helpful for CNE planners and create innovative ideas for them to solve national and regional problems. Thus, the present study has been designed and implemented with the aim of comparative comparison continuous nursing education system in Iran and America. **Method:** This study is a comparative-documentary study in four stages; Description, Interoperation, Comparison, Juxtaposition, that has been done based on "George ZF. Beredy" method. Information provided by American nursing boards in all states and documentation rules in Iran were investigated. These two CNE systems were studied in terms of the history, structure, required hours, accepted activities and reviewing and approving documents by review of existing information. **Results:** Legislation of CNE in Iran and America dates back to 1996 and 1984. reviewing and approving documents of the evidence in Iran was done by the Office of in-service education, free of charge, with the aim of gaining promotion and wage increases, and in America it was performed by the State Nursing Boards, with receiving a fee for the purpose of accreditation and renew RN. **Conclusion:** In both countries, the emphasis is on participation in programs not on the impact of programs on the quality of patient care. If the certification and accreditation of nursing license in terms of taking continuous education in Iran is solved and CNE gets out of the control of in-service education, the differences will be less.

INTRODUCTION

Progress of each country hinges on its competent workforce. Development is attained through training competent and qualified manpower [1]. Health systems are of great importance in the fields of community health, economy and politics of a society [2]. Therefore, continues manpower training in such systems, especially nurses, as the largest and most accessible professional force, to be very important [3]. Several studies have suggested that training nursing staff in hospitals has numerous salubrious results such as improved professional practice, reduction of occupational hazards and medical errors, decreasing client complaints, increasing patient satisfaction and enhancing therapeutic and care indices in hospitals [4-8].

However, continuing education, like all administrative programs, suffers from defects that have been mentioned in various studies. Among others, one can mention Ebadi's study in Iran, Dongfeng in China, Singchungchai in Thailand, Alghadami in Saudi Arabia, Chang in Malaysia and Peck's international study, all of which have emphasized the need to change, modify and improve continuing education programs [9-14].

Conducted researches have often measured the impact of education against the lack of education or compared two methods of education but have never drawn compare of the system of continuing education by other country.

Continuing education systems in different countries have various features according to the circumstances. But there are many different and common things that can guide researchers to improve nursing continuing education programs. Studying the history of continuing education in the world since 1980 is indicative of financial, legal and evaluation challenges [15]. Due to different economic and social growth, centralized or decentralized political systems, different countries have various rules in the field of continuing education. Studying these various laws and structures could be useful for managers of continuing education and produce creative ideas to solve national and regional problems for them.

Evaluating educational systems and programs in different countries is one of the functions of comparative studies. In fact, comparative study is a rational strategy for using the experiences of others in order to better use of available material and spiritual resources. Conducting such studies paves the path for liberating strategies for educational reform from the geographical constraints and manifests itself better through constructing a global insight.

Therefore, in order to understand the situation of a country in the field of continuing education in comparison with another country or what can be done for improve it, recognize the strengths and weaknesses of continuing education, a comparative study should be done in this area, so that other countries can use the results of this study as an example. So, exploring the status of Iran as a developing country in the Middle East and a pioneer in terms of hardware and software development in the continuing education and comparing it with America as an advanced country in the field of professional continuing

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continuing education,
nurses, comparative
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education can guide many studies in the world to make a comparison with the presented framework. Hence, the present study was designed and implemented with the aim of "comparative study of continuing nursing education system in Iran and America".

METHOD

The present study is a comparative-documentary study that has been carried out in four stages of Description, Comparison, Interoperation, and Juxtaposition, based on George ZF Beredys' descriptive-explanatory method.

This study has been done through critical and scientific reviewing the information provided by Nursing Boards of America in all states and available documented information and rules in Iran (statistical population). In this study, two continuing education systems were compared in terms of the history, structure, required hours, accepted and approved activities and reviewing documents with the help of techniques of reviewing the information in the official site of National Council of State Boards of Nursing (NCSBN) of America and head office of continuing education in Iran.

DISCUSSION

First Question: continuing nursing education in Iran and America's history returns to what time?

History of continuing nursing educations in America back to Florence Nightingale who encouraged nurses to continuing education. These educations have systematically begun on the basis of Nursing Boards science 1984 and nurses were incorporated among the three other fields of Medical Sciences (Social services -Medicine-Pharmacology) that were subject to continuing education for work permission [16-17].

Then, Nursing Boards approved and frequently updated laws in this area independently and under the supervision of the National Council of State Boards of Nursing [Board Rule 216.1 (4)] [18].

According to the documentations of the Ministry of Health and Medical Education of Iran, continuing education history goes back to in-service education. At the onset, the Ministry of Health had assumed responsibility for the country's healthcare and educational issues were entrusted with the Ministry of Culture & Higher Education. However, educational and research complexes were established in the Ministry of Health to provide in-service education and short-term courses. Then, Research and Education Deputy was founded and the office of in-service education was subsumed under it.

With the formation of Ministry of Health and Medical Education, the office of in-service education (entitled as "*retraining and free education office*") was set up in the Department of Education deputy and assumed responsibility for previous tasks until 1989. Then, the Office of Continuing Education was established in 1989. That same year, in-service education was transferred from the educational deputy to Human Resources Development deputy. It was then that policy-making, standardization and accreditation of continuing education in medical community was passed as a law [19].

Although continuing nursing education programs in Iran has initiated since 1959-60, it was only after the Islamic Revolution that it was tentatively approved by the Parliament (5 years) as the continuing education courses in medical community in October 1990. Since 1996, due to the legislation of the law of national continuing medical education, promotion and evaluation of the condition of nurses was subject to the presentation of a certificate of participation in continuing education courses. However, continuing nurse education was not Cost in nursing evaluation before regulations of continuing nursing education in 2006. Since then, a team of expert teachers and Nursing Board members have periodically convened meetings in the Department of Continuing medical Education for the confirmation of organized nursing courses. Since 2009, Nursing Continuing Education Office has been based for needs assessment, planning, implementation and evaluation on some colleges [19, 20].

Second Question: what is the administrative structure of continuing education in Iran and America like?

Nursing Boards, with a history of more than a hundred years, have been established with the aim of ensuring the quality of nursing care and protecting people's health by developing and monitoring the implementation of nursing standards and the issuance of a work permission (RN test) and renewing it (CNE) for nurses. Nursing Boards in America are the main custodians of continuing education. These Boards are active in 55 states of America independently. The four states of California, Georgia, Louisiana and Virginia have each two independent boards for RNs and LPN / VNs [21]. In Iran, although there are nursing board and Nursing deputy, Planning, implementation and evaluation of CNE, like other medical professions, is administered by Department of Continuing Medical Education [20].

Today, 4.5 million RNs are working in America that constitutes the second largest group of professionals. According to the latest data from the deputy of Nursing in Iran, 110000 professional and non-professional nurses are working. Therefore, regarding the structures, it must be expressed that they have been selected in proportion to the number of nurses covered by structures. Nevertheless, concentration and integration of nursing responsibilities under the supervision of an

organization (public or private) can be very useful so that the legislation, implementation and evaluation in all areas of nursing from education and research to verification of documents and the work permit can, along with preventing confusion in the implementation and legislation, pave the path for making nursing professional.

Third Question: How many hours of continuing education do nurses in Iran and America need?

In different states of America, the required hours will vary from 10-30 hours every two years. And continuing education hours cannot be saved. Courses that are held by government agencies, hospitals, educational and publishing company, nursing schools and Nursing Science Associations are also acceptable for nursing in other states, if they have taken holding confirmation from the board of a state. However, most courses are offered by the School of Nursing [22]. In 16 states, to confirm the document for any time or for the first time, a nurse is required to have finished certain training courses, in addition to normal working hours or on the same frame. In five states, according to the responsibility and criticality level of nurses' work at different levels of RN / LPN / APRN, educational hours and specific courses are required for the accreditation of the document.

In some states, the boards of nursing have already combine number of hours of CNE and professionals or clinical activity hours for the renewing like Singapore and Malaysia. Some of these items are provided [Table 1] [23].

Table 1: The hour required state educational and specialized courses for nurses, RNs & LPNs

State	Special CE requirements	Hs/ 2 year
Alabama	regulations, Professional conduct, and accountability (first time)	24
Delaware	3 h substance abuse.	30 / LPNs : 24
Columbia	APRNs: including 15 h in pharmacology 3 h on HIV/AIDS is(RN or LPN)	24/ LPN:18
Florida	Domestic Violence, HIV/AIDS, Preventing Medical Errors, laws and rules that govern the practice of nursing, recognizing impairment in the workplace	26
Kentucky	HIV/AIDS CE within the ten-year period. Pediatric Abusive Head Trauma, Domestic Violence (one-time) APRNs: 5 h in pharmacology LPN: IV Therapy-Kentucky Administrative Regulation	28
Michigan	1 h in Pain Management	25
Nebraska	RN: At least 10 of the 20 h must be formally peer reviewed and approved continuing education. Up to 4 h may be CPR or BLS courses.	20
Nevada	Emergency Preparedness or bioterrorism	30
New jersey	RN: Organ and Tissue Donation	30
New York	3 h infection control every 4 years. RNs: 2 h child abuse (one time),	
North Dakota	may be obtained online first time you are NOT REQUIRED to have completed CE courses	12
Oregon	Pain management	7
Pennsylvania	3 h in child abuse	30
Rhode Island	online	10

Texas	2 h in forensic evidence collection for RN practicing in an emergency room setting (one-time) 2 h in older adults and geriatric populations for RNs working with this population 2 h in tick-borne diseases for RNs working with this population 2 h relating to nursing jurisprudence and nursing ethics APRN: 5 h in pharmacotherapeutics	20
Puerto Rico	3 h of infection control that includes HIV, Hepatitis and TB	30/ LPNs:21
California/Colorado/ Kansas/ New Hampshire/ New Mexico/		30
Minnesota		24/ LPNs:12
Massachusetts		15
Illinois		20
Iowa/ Montana/ Ohio/ Oklahoma		24
Louisiana		5 h (full-time), 10 h (part-time), 15 h (not employed or worked less than 160 h).

Also, in 12 states including Arizona, Connecticut, Hawaii, Idaho, Indiana, Maine, Maryland, Mississippi, Missouri, South Dakota, Vermont and Wisconsin there is no need to CNE hours. In 11 states, some laws have been enacted to replace CNE hours [22,23], fully described in [Table 2].

Table 2: Activities alternative to continuing education hours for nurse

State	H/ 2 year	Replace
West Virginia*	24	6 h of CE and; 1. National certification (NC), 2. Completion of a nursing research project as investigator, co-investigator, 3. Published a nursing article, 4. Participated as a clinical preceptor for at least 1 student or one new employee undergoing orientation and have 120 h of one-on-one relationship, 5. Completion of an approved nursing refresher or re-entry course
Arkansas	15	NC, OR completion of a recognized academic course
Alaska	30	30 h professional nursing activities, OR 320 h nursing employment.
Georgia	30 LPNs:20	NC, OR Completion of an accredited academic program of study in nursing or a related field, OR (500) h practice, OR reentry program or graduation from a nursing education program

North Carolina	30	NC, OR Completion of a Board approved refresher course. OR Completion of 2 semester hours of post-licensure academic OR 15 h of CE and: 1) Completion of a nursing project as investigator or co-investigator. 2) Authoring or co-authoring a nursing related article, paper, book or book chapter. 3) Developing and conducting a nursing continuing education presentation or presentations totaling of 5 h, 4) 640 h of active practice
South Carolina	30	NC, OR Completion of an academic program in nursing, OR Verification of competency and the number of hours practiced as evidenced by employer certification
UTAH	30	200 practice h and 15 h, OR 400 practice h.
Virginia	30	NC, OR Completion of a minimum of 3 credit h of post-licensure academic education relevant to nursing , OR A board-approved refresher course , OR Completion of nursing project or research study, OR Completion of publication as the author or co-author, OR Teaching a nursing-related 3 h in semester, OR Teaching nursing CE courses for up to 30 h, OR 15 h of workshops, seminars, conferences + 640 h of nursing practice
Washington	45	531 h of nursing practice
Wyoming	20	NC, 1600 h in Nursing practice, OR 500 h in Nursing practice, OR Passing NCLEX
US Virgin Islands	15	320 h clinical practice + 15 h of professional activities.

*Special CE requirements: RNs: 2 h in mental health and 3 h in drug diversion training and best practice prescribing of controlled substances. LPNs: 2 contact h of end-of-life care including pain management and 3 h in substance abuse.

According to Continuous Education Act in Iran, nurses need annually to earn 15 points of CNE, equal to 30 hours, and lost points in a year are not repairable in the next year. Additional points cannot be stored for later years. Although no specific differences is observed between the two countries in terms of hours of CNE, according to the recent decision of the Supreme Council for Continuing Medical Education (2009) in Iran only nurses with bachelor, master and PhD degrees are eligible for CNE rules while orderly and diploma in nursing are not subject to these laws. On the other hand, no specific division has been considered for the documents and the responsibility of nurses in CNE rules and taking specific courses or earning training hours at the beginning of activities are not considered obligatory for them. Because, in Iran, due to lack of nurses, there is no legal basis for the confirmation or accreditation of the document and the work permit ^[19]. Moreover, the required training is related to the field but not to the work environment so that a pediatric critical care nurse can participate in general course of basic or advanced CPR in adults and his CNE hours are acceptable. Therefore, in-service and Irrelevant to ward or degree courses will be accepted. It is considered one of the weak points in Iran that no special status has been considered for CNE compared to in-service education.

Fourth Question: What are the acceptable and alternative activities for codification courses of continuous education in Iran and America?

As shown in [Table 2], in 11 states instead of online or in-person courses, other activities have to be counted such as: Clinical teaching to pioneers or students (5 hours), publication of scientific papers in prestigious journals related to nursing or publication of a book or a chapter in a book or producing instructional materials such as CDs or tapes (15-30 hours), PhD thesis or research project (30 hours), Lecturing at scientific seminars (1 hour), reading scientific papers, clinical or professional activities, educating in higher degrees of nursing (each 3-month term is calculated equivalent to 10 hours and 4.5 month terms equivalent to 15 hours), doctoral dissertation (30 hour). It should be noted that hours allocated to the mentioned activities are various in different states ^[24].

In Iran, CNE have been defined in the form of congress, seminars, workshops, and conferences or codification programs (at least 20% of points must be earned through these programs), short-term professional education courses, educational & research activities and self-study. There are no differences between in-person or in-absentia programs except that, at best, only 40% of points can be related to in-absentia programs. Alternative activities, also, are defined as follows: Lecture or poster presentations at conferences with points in continuing education (maximum 5 points, with a extent of 10 points), oversee programs with a maximum of 25 points [Table 3], authoring or translating a book or an article, receiving a valid certificate of academic degrees (exempt from earning continuing education points during study). As a

result, it does not seem that there is much difference between the two systems of continuing education in this respect.

Table 3: Points of training programs abroad

Participating in congress, seminars and conferences	Maximum 5 days - 4 points each day
poster	Each case 6 points
lecture	Each case 10 points
Workshop	Maximum 5 days - 5 points each day
training course	2 points each day- maximum 25 points in a year

Fifth Question: In what way are review and approval of continuing education hours for nurses in Iran and America done?

According to the rules of nursing board, in order to confirm their degrees and extend their work permit, nurses need to provide documents every 2-3 years or 5 years (within determine one-month interval). With respect to their particular circumstances each year, every state may also introduce a new set of education hours as a part of their mandatory CNE. In case of incomplete CNE hours, documents will be returned to complete and more search will be requests considered and or some penalties will be considered for nurses, such as: Suspension from work, limiting the activities, fine, professional disqualification and official reprimands [25, 26]. In Iran, CNE documents are issued by the offices of continuing education based at the universities and evaluated by the personnel department of hospitals to extend the contract or assessed by educational supervisors to improve their level. Of course, there are no certain punitive legislation in this field and are not implemented accordingly, because these hours can be replaced with hours of in-service education [Table 4]. Another difference that there is in the field of laws is that, due to financial strength and authority human force Development Deputy and in-service education centers, continuing education for nurses has been overweighed by in-service education. And continuing education constitutes only 30 hours of in- service education rules (150 hours required) that is not a significant portion. Besides, it has been observed that in-service education rules have classified nurses, along with other jobs, as non-professional.

Table 4: Compare the overall system of CNE in Iran and America

Country	Iran	America
legislation of CNE	1996	1984
Compiler, confirmer and fund provider	Continuous Education Department of the Ministry of Health and Medical Education	State nursing board
Performers	Continuous Education Offices of universities, hospitals, nursing colleges, scientific societies, Nursing Council	Nurses association, big hospitals, nursing schools
Required hours	30 hours per year	10-30 hours every 2 years.
Cost	The learners, Universities of Medical Sciences (optional), pharmaceutical companies indirectly	Drug companies and supporter insurance agencies 58% , the learners 42%
The average cost of company in courses	1-3 dollars an hour	8-12 dollars an hour
auditing and review	In-service training offices, free of charge	State nursing boards, with fee
Lack of required hours	Deprived of annual upgrades Compensation through in-service training courses	Suspension-fine-review-abrogating work permits

The purpose of the review	Earning promotion and pay rise	Accreditation and permitting the operation
Continuous Education Philosophy	Health promotion through: Improve the quality of continuous education, Supporting the learners, Compiling continuous education standards	Protect the public's health and welfare by assuring that safe and competent nursing and by outlining the standards for safe nursing care and issuing licenses to practice nursing.

One highly important thing at this time that some other differences also stem from it is to pay attention to the vision and mission of the organization responsible for CNE in both countries. The head office of CNE in Iran defines its mission as follows: in order to improve health, Department of continuous medical education serves through continuing education to all graduates of the medical community, making policy of continuous medical education aimed at protecting the subject and establishing continuous medical education standards and funding continuous education centers serves to improve the quality of continuous education. In fact, this organization intends to achieve health promotion through improving the quality of continuous education, supporting the learners and establishing continuous education standards. While, the NCSBN of America has defined a vision and mission as follows: The boards of nursing (BONs) that comprise NCSBN protect the public's health and welfare by assuring that safe and competent nursing care is provided by licensed nurses. BONs achieve this mission by outlining the standards for safe nursing care and issuing licenses to practice nursing. In principle, it considers protecting the health and welfare of the community as its main task through performing care by qualified undergraduate nurses. In fact CE is a means of certifying the competence of nurses and not merely a means for earning a higher income.

CONCLUSION

Although in both countries (most states in America) participating in CNE programs is compulsory, the emphasis is on participation in programs not on the impact of programs on the quality of patient care. On the other hand, despite all the differences, it seems that if the certification of nursing documentation and work permission in terms of taking CNE is solved in Iran and continuous education gets out of the control of in-service training, the differences will be less. Some other differences originate from the type of political systems of the two countries; in a way that Iran is governed in a centralized manner while America is managed in a State fashion. Hence, the difference in the management structure of CNE system will also follow such circumstances in each country.

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CONFLICT OF INTEREST

There is no conflict of interest.

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REFERENCES

- [1] Ross MM, Carswell A, Dalziel WB, Aminzadeh F. [2001] Continuing education for staff in long-term care facilities: corporate philosophies and approaches. *J Contin Educ Nurs* 32:68-76.
- [2] Augustsson H, Törnquist A, Hasson H. [2013] Challenges in transferring individual learning to organizational learning in the residential care of older people. *J Health Organ Manag* 27:390-408.
- [3] Clark J, Baker B, Baker D. [2009] Getting eHealth into basic nursing education: report of the RCN information in nursing project. *Stud Health Technol Inform* 146:534-9.
- [4] Organization WH. [2000] The world health report health systems: improving performance: WHO- 2000. Available from: <http://www.who.int/whr/2000/en/>
- [5] Jalali R, Abdul-Maleki P, Kahrizi M. [2006] Continuous nursing education from nurses' point of view. *J Kermanshah Univ Med Sci* 10:67-75.
- [6] Runru Z, Yanmei H. [2011] A survey and analysis on distance nursing continuing education network resources use of students. *Chin Gener Nurs* 12:44-7.
- [7] Yun L, Shiwei G, Haihong Z, Lin S, Aiqin Z, Jinjin W. [2013] Establishment of hospitalwide continuing nursing education management system: reflections on it. *J Nurs Sci* 2:47-53.
- [8] Shumin Z, Xia X. [2010] Qualitative study on cognition of hierarchical continuing nursing education of clinical nurses in comprehensive hospitals. *J Nurs Sci* 17: 34-

- 9.
- [9] Emamzadeh Ghasemi H, Vanaki Z, Memarian R. [2004] The effect of using "applied in-Service education model" on quality of nursing care in surgery unit. *IJME* 4:13-21.
 - [10] Chang E, Chenoweth L, Hancock K. [2003] Nursing needs of hospitalized older adults Consumer and nurse perceptions. *J GerontolNurs* 29:32-41.
 - [11] Phillips JM. [2005] Strategies for active learning in online continuing education. *J Contin Educ Nurs* 36:77-83.
 - [12] Hossini SM, Moghimib M, Karimic Z, Momenid E, Sadat SJ. [2012] Perspective of nurses working in medical-training hospitals in Kohkiluyeh and Boyer-Ahmad province towards continuing education. *Life Sci J* 9:22-9.
 - [13] Xiao LD. [2008] An understanding of nurse educators' leadership behaviors in implementing mandatory continuing nursing education in China. *Nurse Educ Pract* 8:321-7.
 - [14] Chong MC, Sellick K, Francis K, Abdullah KL. [2011] What influences Malaysian nurses to participate in continuing professional education activities? *Asian Nurs Res* 5:38-47.
 - [15] Singchungchai P, Ingkathawornwong T, Kritcharoen S, Inthanon T, Limchai-arunreung S, Phanthong U. [2009] Management of continuing education of nurse midwives by chief nurses in community hospitals in Southern Thailand. *Asian Nurs Res* 3:147-53.
 - [16] Alghamdi AMS. Challenges of continuing medical education in Saudi Arabia's hospitals. 2012. Newcastle University eTheses. Available from: <http://hdl.handle.net/10443/1774>.
 - [17] Peck C, McCall M, McLaren B, Rotem T. [2000] Continuing medical education and continuing professional development: international comparisons. *Brit med j*, 320:432-5.
 - [18] Ebadi A, Vanaki Z, Nahrir B, Hekmatpou D. [2008] Pathology of continuing educational programs in Iran Medical Society. *Stri Devl Med Edu J*, 4:140-5.
 - [19] Jang KS, Kim H, Kim EA, Kim YM, Moon JE, Park H, et al. [2013] A Journey to Action Research in a Clinical Nursing Context. *J Korean Acad Nurs Adm*, 19:95-107.
 - [20] Stein AM. [1998] History of continuing nursing education in the United States. *J Contin Educ Nurs*. 29:245-52.
 - [21] Haras MS. [2015] Continuing Nursing Education. Development and Initial Validation of the NephRN Perceptions Toward Advance Care Planning Instrument. *Nephrol Nurs J*.42:257-67.
 - [22] Cooper SS. [1973] A brief history of continuing education in nursing in the United States. *J Contin Educ Nurs*, 4:5-9.
 - [23] Schor I. [1981] The continuing nursing education and adult education movements in the United States. *Nurs Forum*, 20:86-101.
 - [24] Nursing TBo. [2015] CNE rules. www.bon.texas.gov .In: Nursing TBo, editor. Available from: <https://www.ncsbn.org/contact-bon.htm>
 - [25] Education deputy.continuing medical education, 2009-2015. Available from: <http://cehp.behdasht.gov.ir/>
 - [26] Iran icpo. [1996] continuing medical education rule of iran. Available from: <http://cehp.behdasht.gov.ir/>
 - [27] Nursing NCoSBo. [2011] What you need to know about nursing licensure and boards of nursing. Author, Chicago, IL. Available from: <https://www.ncsbn.org/3753.htm>
 - [28] Institute IoMCoPaChCPE. Redesigning continuing education in the health professions: National Academies Press, 2010. Available from: <http://www.nap.edu/catalog/12704/redesigning-continuing-education-in-the-health-professions>
 - [29] Boards of Nursing State CE Requirements, 2016. Available from: https://www.bon.texas.gov/education_continuing_education.asp
 - [30] DeVito v. [2009] COMMISSIONER OF INTERNAL REVENUE. TC Summary Opinion: Tax Court, 5 . Available from: www.ustaxcourt.gov/.../devito.sum.WPD.pdf
 - [31] McClellan v. [2006] McClellan. So 2d: Ala: Court of Civil Appeals, 658. Available from: <http://www.google.com/url?...original.pdf&usg>.
 - [32] Burnsed v. [2010] Merritt. So 3d: Miss: Court of Appeals, 655. Available from: courts.ms.gov/Images/.../C073868.pdf.

ARTICLE

CYTOTOXIC EFFECT OF THE ROOT EXTRACT OF BERBERIS ORTHOBOTRYS ON HELA CELL LINE

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ABSTRACT

Background: *Berberis orthobotrys* have long been used traditionally as an herbal remedy for treatment of a variety of Diseases in north of Iran. **Objectives:** The aim of this study was to evaluate the cytotoxic effect of the root extract of *Berberis orthobotrys* on HeLa cell line. **Materials and Methods:** Different concentrations of the ethanolic extracts of the roots of *B. orthobotrys* (10, 7.5, 5, 2.5, 1.25, 0.625, 0.312, 0.156 mg/ml) were subjected to cytotoxic study against HeLa cervical cancer cell lines by employing MTT assay, and apoptosis of the cancer cells was confirmed by acridine orange-propidium iodide(AO/PI) staining. **Results:** The ethanolic extract of the roots of *B. orthobotrys* showed a significant cytotoxicity in (2.5, 1.25, 0.625, 0.312, 0.156 mg/ml) concentrations. The maximum reducing power of the *Berberis orthobotrys* extract to HeLa cell line at 492 nm was found to be 0.0506 ± 0.01125 ($P \leq 0.01$) at 0.156 mg/ml versus control group. The highest inhibition percentage with regard to cytotoxicity was found to be 83.2 7% at 0.156 mg/ml with IC_{50} value of 2.68 mg/ml. This extract did not have any cytotoxic effect on normal cells. **Conclusion:** Our study shows that ethanolic extract of the roots of *B. orthobotrys* have cytotoxic effects on HeLa cell line. It seems that *B. orthobotrys* could be considered as a promising chemotherapeutic agent in cancer treatment. But further study is needed to fractionation for isolation and identification of biologically active substance from this extracts.

INTRODUCTION

Berberis L. includes about 500 species of spiny or unarmed, evergreen or deciduous shrubs which grow in Asia and Europe, especially in India and Iran [1]. Some *Berberis* spp. including *B. crataeging*, *B. integerrima*, *B. khorasanica*, *B. orthobotrys*, *B. vulgaris*, *B. thunbergii* mainly grow in Iran. Their roots, barks, leaves and fruits are often used as a folk medicine [2,3]. *Berberis orthobotrys* have long been used traditionally as a herbal remedy in North of Iran. The fruit or freshly pressed juice, is used in treatment of liver and gall bladder problems, kidney stones, menstrual pains etc. [4,5]

KEY WORDS

Cytotoxicity, *Berberis orthobotrys*, HeLa cell line, MTT assay.

It is shown that the amount of seven alkaloids (oxyacanthine, berbamine, isotetrandrine, columbamine, jatrorrhizine, palmatine, and berberine) in 17 species of *Berberis* Such as: *B. tabiensis*, *B. coletoides*, *B. microphyll*, *B. koroana*, *B. vulgaris*, and etc. were the highest in root barks followed by stem barks, root wood, and stem wood. Among these 17 species, berberine was the richest alkaloid while berbamine, jatrorrhizine, and palmatine were irregular in content [6,7]. Mazumder and et al, reported that the roots in some species of *Berberis* such as: *B. asiatica*, *B. lycium*, *B. vulgaris*, *B. aristata*, *B. nepalensis* contain alkaloids, taxilamine protoberberine and berberine, that berberine is a yellow alkaloid, a bitter substance, which dissolves in acids and forms salts of the alkaloid [8]. Yang and et al found that berberine and berbamine are two major pharmaceutical compositions in the roots of different species such as *B. aristata*, *B. sanguine*, *B. taronesis*, *B. vulgaris* that have potential bioactivities such as antitumor, antidiabetic, antihyperlipidemic, anti-arrhythmic, and neuro-protective activities^[4]. And also Gan in 2012 in his latest studies on berberine has shown more bioactivities, such as antioxidant, anti-microbial, anti-cancer, cardiovascular protective, anti-obesity, hepatoprotective, gastrointestinal protective, anti-rheumatic, anti-angiogenic and anti-clastogenic effects [9]. Recently, the effect of berberine was investigated on cancer cell and berberine showed potential anti-cancer activity against cancer cells. Its anti-cancer effect was mainly attributed to its actions on inducing cancer cell death, suppressing cancer cell growth and inhibiting cancer cell metastasis [10].

We briefly introduced phytochemical and pharmaceutical bioactive components of the *Berberis* spp. in medicinal use. Although a large number of studies on the pharmacological effects of berberies spp. and its components, in particular berberin, has been reported [1, 9, 10], no research has been done on cytotoxic effects of *B. orthobotrys*. So in this study we evaluated the cytotoxic effect of ethanolic extract of the roots of *B. orthobotrys* on HeLa cell line.

MATERIALS AND METHODS

Plant material

The plant *B. orthobotrys* was collected from around Veresk and was identified by Dr. Bahman Eslami, (Assistant Prof. of plant system, Islamic Azad University of Qaemshahr, Iran). Voucher specimens were deposited with the faculty of biology herbarium (as NO 720-654). Then, about 2 kilos of its roots were collected, washed with cold water, cut into small pieces, dried in the shade, and mechanically ground to produce a fine powder. Dry powder was extracted with ethanol for about 2 days at room temperature. Dry

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ethanolic extracts were obtained after removing the solvent by evaporation. The dried ethanolic extract was used for evaluation of cytotoxicity activities.

Cell lines

The HeLa cell line used for assay was purchased from the cell bank, Pasture Institute (Tehran, Iran). Cells were grown in RPMI-1640(PAA) [each 500 ml of RPMI-1640 was supplemented with 10% of fetal calf serum (FBS) (PAA), penicillin (100 IU/ml) streptomycin (100 µg/ml) (PAA)] in a humidified atmosphere of 5% CO₂ at 37°C. The cells were dissociated with 0.2 % trypsin (Gibco) in phosphatebuffer saline solution. The stock cultures were grown in 25 cm² tissue culture flasks and all cytotoxicity experiments were carried out in 96 well plates.

Isolation of peripheral blood mononuclear cells

Peripheral blood was immediately drawn into heparinized sterile 15 ml conical tube, layered on to an equal volume of Ficoll and centrifuged at 1500×g for 20 min. Cells were then harvested from the Ficoll-plasma interface and washed three times in RPMI1640 medium. Cells were suspended at 1×10⁴/ml in RPMI1640 supplemented as above. Cell viability was always >95%, as estimated by trypan blue exclusion.

MTT Assay for cytotoxic activity

Cytotoxic effect of the extracts against HeLa cells was measured by MTT assay (MTT, Sigma) [11]. 100 µl of cell suspension (1×10⁴ cell/ml) were cultured in 96 well microplate and were incubated for 24 h (37°C, 5% CO₂ air humidified). Then 100 µl of different concentrations of extract including 0.156, 0.312, 0.625, 1.25, 2.5, 5, 7.5 and 10 mg/ml, were added and the microplates were further incubated for 72 h at the same qualification. Dilution of stock solutions was made in culture medium yielding final extracts concentrations with a final DMSO concentration of 0.1%. This concentration of DMSO did not affect cell viability. Control cells were incubated in culture medium only. All concentrations of plants extracts were in triplicates on the same cell group. For examination of the effect of the extract on normal cells, we used peripheral blood mononuclear cells at 1×10⁴/ml in RPMI1640. To consider the cell survival, each well was then incubated with 20 µl of MTT solution (5 mg/ml in phosphate buffer solution) for 3-4 h. Then, the media in each well was gradually replaced with 100 µl DMSO and gently shaken to dissolve the formazan crystals. The absorbance of each well was determined at 492 nm using the ELISA reader (Awareness, USA).

The percentage of growth inhibition was calculated using following formula,

$$\% \text{cell inhibition} = 100 - \{ (At - Ab) / (Ac - Ab) \} \times 100$$

Where,

At=Absorbance value of test compound

Ab=Absorbance value of blank

Ac=Absorbance value of control

The effects of extracts were expressed by IC₅₀ values (the drug concentration reducing the absorbance of treated cells by 50% with respect to untreated cells).

Observation of morphological changes

The HeLa cells were cultured in 96 well culture plates (1×10⁴ cells per well) in RPMI-1640 supplemented with 10% FBS for 72 h. The cells were treated with or without the root extract of *B. orthobotrys* at various concentrations. After 72 h, cellular morphology was observed under the inverted microscope and pictures were taken.

Detection of apoptotic cells

Morphological changes of apoptosis were assessed using acridine orange-propidium iodide (AO/PI) staining. Cell suspensions (1×10⁴ cell/ml) were seeded in 96-well plate and incubated for 24 h. In the next day, the Cells were treated with 1.25 mg/ml concentration of extract for 4, 24, 48, 72 h. Cells were then fixed with 70% ethanol for 20 min and stained with a solution composed of Ao/PI (50 µl of 10 µg/ml AO and 50 µl of 50 µg/ml PI) for 30 min, after being washed with PBS, cells were examined using fluorescence microscopy Motic AE 31 (Australia) and photographed.

Statistical Analysis

Results were presented as means ± SEM. Differences between control and test values were determined by Student's *t* test and were accepted as significant when *p*<0.05. The IC₅₀ values were calculated from linear regression analysis.

RESULTS

The results of cytotoxic assays of different concentrations of the root extracts of the *B. orthobotrys* on HeLa cells are shown in [Fig. 1, 2, 3] and [Table 1]. The ethanolic extracts of the roots of *B. orthobotrys* showed significant cytotoxicity in (2.5, 1.25, 0.625, 0.312, 0.156 mg/ml) concentrations. The maximum reducing power of the *B. orthobotrys* extract to HeLa cell line at 492 nm was found to be 0.0506 ± 0.011 ($P \leq 0.01$) at 0.156 mg/ml. The highest inhibition percentage with regard to cytotoxicity was found to be 83.27% at 0.156 mg/ml with IC_{50} value of 2.68 mg/ml. The results showed that the extract had no effect on normal (lymphocyte and monocyte) cells.

Table 1: Cytotoxic Activity of Ethanolic Extract of the roots of *B. orthobotrys* on HeLa Cell Line at Different Concentrations by MTT Assay

Concentration of <i>Berberis orthobotrys</i> (mg/ml)	Absorbance, Mean \pm SEM	%Inhibition	IC_{50} (mg/mL)
0.156	$0.05 \pm 0.011^{**}$	83.27	
0.312	$0.072 \pm 0.005^{**}$	72.08	
0.625	$0.071 \pm 0.002^{**}$	72.2	
1.25	$0.055 \pm 0.008^{*}$	79.09	
2.5	$0.083 \pm 0.007^{*}$	65.7	
5	0.22 ± 0.006	5.8	
7.5	0.33 ± 0.034	-50.7	
10	0.43 ± 0.017	-100.2	
Lymph	0.235 ± 0.013	-67.6	
DMSO	0.473 ± 0.034	-7.2	
Control	0.227 ± 0.021		

Morphology of untreated and treated cells was observed under inverted microscope, to evaluate apoptotic features of the cells. From [Fig. 1], it can be seen that untreated control cells showed normal appearance, which were elongated and flattened outgrowths, while the treated cells showed obvious morphological changes at concentration of 1.25mg/ml of extract. The transformed cells were shrunken, rounded, shiny, and condensed and showed surface blebs.

In addition, morphological changes in nuclei were observed in all cell line. It indicated that the extract caused marked apoptotic changes in a time- dependent manner, characterized by nuclear shrinkage and chromatin condensation [Fig. 2].



(A)



(a)

Fig.1: Morphological changes of cancer cell line after being treated with extract under inverted microscope (A) HeLa cell - Control, (a) Treated HeLa cell with 0.156 mg/ml of extract (Magnification 200 \times)

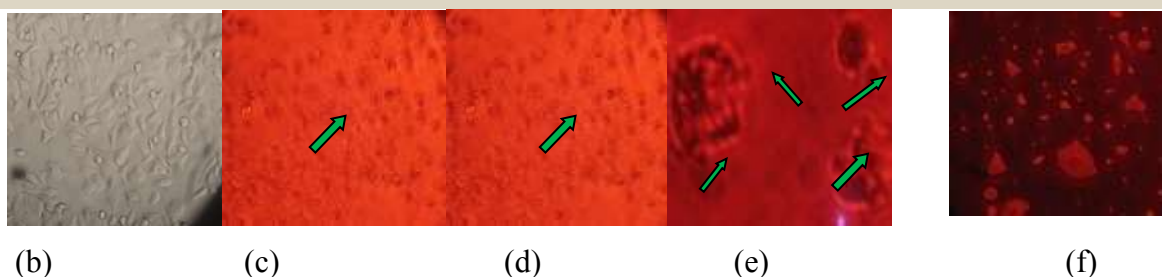


Fig. 2: Induction of morphological changes in shape and in nuclear (a) Control HeLa cells (b) HeLa cells treated with 1.25 mg/ml concentration of root extract of *B. orthobotrys* for 4 (b), 24 (c) (Magnification 200×), 48 (d), 72 (f) (Magnification 400×) hours when observed under the fluorescence microscope

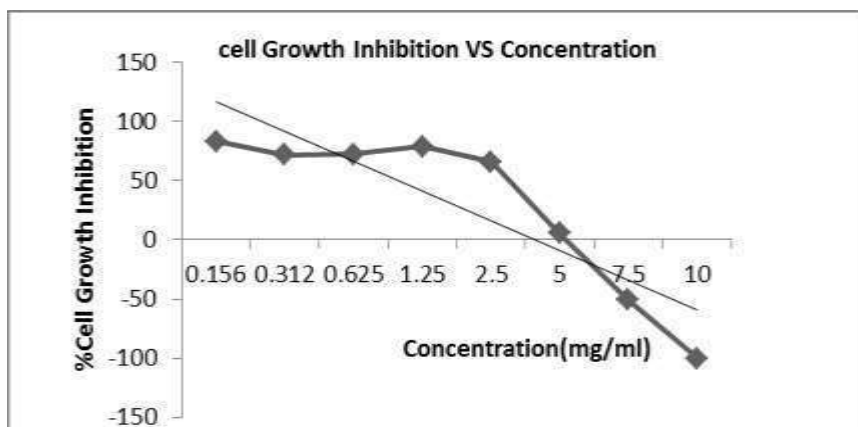


Fig. 3: Growth Inhibition of *B. orthobotrys* Roots Extract Against HeLa cell Line by MTT Assay

DISCUSSION

Natural herb extracts have biologically active compounds and have been used for a long time as a resource of new drugs. Anticancer activity is one of those effect among most of all effects that has been reported in vitro research. *B.orthobotrys* is a traditional remedy that is used in North of Iran. The major component of the roots of berberis plants, alkaloid berberine, has shown some bioactivities, such as antioxidant, anti -microbial and anti-cancer [9]. In this research, the cytotoxic effect of *B.orthobotrys* in different concentrations (10, 7.5, 5, 2.5, 1.25, 0.625, 0.312, 0.156 mg/ml) was studied.

The results of cytotoxic assays of different concentrations of the roots extract of *B. orthobotrys* on HeLa showed significant cytotoxicity in 2.5, 1.25 ($P \leq 0.05$), 0.625, 0.312 and 0.156 mg/ml ($P \leq 0.01$) concentration [Table 1]. The highest cytotoxicity of this extract against HeLa cell was found in 0.156 mg/ml concentration with percent of cell growth inhibition [Fig. 3]. And this extract did not have any cytotoxic effect on normal (lymphocyte and monocyte) cells. The approximate concentrations of the extracts to reduce viability of the cells to about 50% (IC₅₀) showed for HeLa, 2.68 (mg/ml).

This result indicates that, the cytotoxic effects of this extract may be mostly due to the presence of alkaloids berberine, while the other ingredients of the crude extract may also contribute to these activities.

It was reported that berberine could suppress the growth and proliferation of different cancer cells. Cell cycle arrest was the main mechanism involved in this process. Berberine could promote cell cycle arrest at G₀/G₁ checkpoint via inhibiting expression of cyclin D₁ [12,13] and also induce G₁-phase cell cycle arrest [14] by increasing the expression of Cdk inhibitory proteins and inhibiting the expression of cyclin-dependent kinase (Cdk)2, Cdk4, Cdk6 and cyclins D1, D2, and E [15]. In addition, G₁/S, G₂/M and s-phase cell cycle arrests were involved in berberine-induce cell cycle arrest [16].

In this study, we found that *B.orthobotrys* exhibited a significant effect on the morphological features of the cancer cells tested, indicating that *B.orthobotrys* induces apoptosis in time-dependent manner. We observed that treatment of cells with 1.25mg/ml of extract, reduced the cell viability, inhibited the cell growth, changed cell adhesion to the substrate, created a star-shaped morphology, pigmented the cells and formed apoptotic bodies [Fig. 1, 2].

Choi and et al had also shown that apoptosis is the most common way involved in berberin-induced cancer cell death in many cell lines [10]. Berberine could activate mitochondria and caspase-dependent

apoptotic pathway in vitro [17]. In cultured cancer cell lines, it could induce the disruption of the mitochondrial Trans membrane potential, release of cytochrome c and apoptosis-inducing factor from the mitochondria to the cytosol [18].

By our analyses through MTT assay, morphological observation with the help of fluorescence microscopy and inverted microscopy, we could confirm that ethanolic extract of *B.orthobotrys* have cytotoxic effect on HeLa cells. Our study for the first time proves the anticancer and cytotoxic potentials of *B.orthobotrys* on HeLa cells by inducing apoptosis in these cancer cells.

These findings conform the folklore medicinal uses and suggest that *B.orthobotrys* has great potential as a source for new drug development.

CONCLUSION

Our study shows that ethanolic extract of the roots of *B. orthobotrys* has cytotoxic effects on tumor cells, but it does not have any cytotoxic effect on normal cells. It seems that berberine in *B. orthobotrys* could be considered as a promising chemotherapeutics agent in cancer treatment.

CONFLICT OF INTEREST

There is no conflict of interest

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FINANCIAL DISCLOSURE

None

REFERENCES

- [1] Yang D, Yan-Ze L, Yong P, hong-zhi Q, Pei-pen X. [2011] Chinese Herbal Medicines 3:272-288.
- [2] Hanachi P, Othman F, Motaleb G. [2008] Effect of *Berberis vulgaris* aqueous extract on the apoptosis, sodium and potassium in hepatocarcinogenic rats. Iran. J basic med sci. 16:62-69.
- [3] Gulfraz M, Asad MJ, Qaddir G, Mehmood S, Shaikat S, Parveen Z. [2008] Phytochemical constituents of *Berberis lyceum* Royle and *Justicia adhatoda*. J. Chem. Soc. Pakistan. 30: 453-457.
- [4] Shamsa F, Ahmadiani A, Khosrokhavar R. [1999] Antihistamic and anticholinergic activity of barberry fruit in the guinea-pig ileum. J. Ethnopharmacol. 64: 161-166.
- [5] Ikram M. [1975] A review on the chemical and pharmacological aspects of genus *Berberis*. Planta Medica. 28: 353-358.
- [6] Xiao PG, Song WZ, Liu GS, Chen BZ, Lv JS. [1974] Study on the medicinal plant resources of *Berberis* in China—including their taxonomy, distribution and evaluation medicinal. Acta Phytotaxon. 12: 383-406.
- [7] Wang F, Gao Y, Gao L, Xing T. [2011] Study on the electrochemical behavior of the anticancer herbal drug berberine and its analytical application. J Chinese Chem Soc 58.
- [8] Mazumder P, Das S, Das M. [2011] Phyto-Pharmacology of *Berberis aristata* DC. J Drug Delivery. Therapeutics. 1: 46-50.
- [9] Ren YG. [2012] Bioactivities of Berberine. Int. J. Modern Biol. Med. 1:48-81.
- [10] Choi MS, Oh JH, Kim SM, Jung HY, Yoo HS, Lee YM, Moon DC, Han SB and Hong JT. [2009] Berberine inhibits p53-dependent cell growth through induction of apoptosis of prostate cancer cells. Int J oncology. 34: 1221-1230.
- [11] Mosmann T. [1983] Rapid colorimetric assay for cellular growth and survival: Application to proliferation and cytotoxicity assay. J Immuno Methods. 16:55-63.
- [12] Kim JB, Yu JH, Ko E, Lee KW, Song AK, Park SY, Shin I, Han W, Noh DY. [2010] The alkaloid Berberine inhibits the growth of Anoikis-resistant MCF-7 and MDA-MB-231 breast cancer cell lines by inducing cell cycle arrest. Phytomed. 17: 436-440.
- [13] Luo Y, Hao Y, Shi TP, Deng WW, Li N. [2008] Berberine inhibits cyclin D1 expression via suppressed binding of AP-1 transcription factors to CCND1 AP-1 motif. Acta Pharmacol. Sinica. 29:628-633.
- [14] Eom KS, Hong JM, Youn MJ, So H, Park R, Kim JM, Kim TY. [2008] Berberine induces G1 arrest and apoptosis in human glioblastoma T98G cells through mitochondrial/caspases pathway. Biol. Pharm. Bull. 31: 558-562.
- [15] Mantena SK, Sharma SD, Katiyar SK. [2006] Berberine inhibits growth, induces G(1) arrest and apoptosis in human epidermoid carcinoma A431 cells by regulating Cdk1-Cdk-cyclin cascade, disruption of mitochondrial membrane potential and cleavage of caspase 3 and PARP. Carcinog. 27: 2018-2027.
- [16] Khan M, Giessrigl B, Vonach C, et al. [2010] Berberine and a *Berberis lycium* extract inactivate Cdc25A and induce alpha-tubulin acetylation that correlate with HL-60 cell cycle inhibition and apoptosis. Mutation Res.-Fundam. Mol. Mechan. Mutagen. 683: 123-130.
- [17] Patil JB, Kim J, Jayaprakasha GK. [2010] Berberine induces apoptosis in breast cancer cells (MCF-7) through mitochondrial-dependent pathway. Europ J Pharm. 645: 70-78.
- [18] Burgeiro A, Gajate C, Dakir H, Villa-Pulgarin JA, Oliveira PJ, Mollinedo F. [2011] Involvement of mitochondrial and B-RAF/ERK signaling pathways in berberine-induced apoptosis in human melanoma cells. Anticancer Drugs. 22: 507-518.

ARTICLE

CYTOTOXICITY EFFECTS OF ETHANOLIC EXTRACT OF AERIAL PARTS OF NASTURTIUM OFFICINALIS ON HELA CELL LINE

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ABSTRACT

Background: Today, there has been growing interest in developing natural products for anticancer drugs due to their diverse pharmacological properties and benefits. In this study, we decided to assess the cytotoxic effect of the ethanolic extract of aerial parts of *N. officinalis* on Hela cells. **Methods:** Hela cancer cell line was obtained from National Cell Bank of Iran and cultured in RPMI. The ethanolic extract of aerial parts of *N. officinalis* was applied in 8 different concentrations. To evaluate the cytotoxicity effect of the extract on Hela cell line, MTT colorimetric assay was applied. **Results:** The highest percentage of cell growth inhibition was 91.8% at 1.25 mg/ml concentration. The IC₅₀ was measured as 0.305 mg/ml. **Conclusion:** Based on the results of this study, the ethanolic extract of aerial parts of *N. officinalis* has cytotoxic effects on the Hela cell line. Isolation of effective compounds of this extract and evaluation of their effects on tumor-bearing animal models are necessary.

INTRODUCTION

KEY WORDS

cytotoxic, *Nasturtium officinalis*, Hela

The conventional modality for cancer therapy by radiation and chemotherapy cause serious side effects like fatigue, diarrhoea, nausea, hair loss, skin problems, malfunction of urinary bladder and decrease in RBCs due to cytotoxicity and genotoxicity of radiation and chemotherapeutic agents on the non-tumor cells [1]. A successful anticancer drug is one that kill or in capacitate cancer cells without causing excessive damage to normal cell [2]. The plant-based anticancer drugs are being remarked by scientists due to their diverse pharmacological properties and benefits. Currently 25% of all prescription drugs are derived from natural sources and for anti-cancer drugs, more than 80% are plant-derived compounds [3]. The plant-derived anticancer drugs act via different pathways, which ultimately result in activation of apoptosis of cancer cells leading to cytotoxicity [4].

Cruciferous Vegetables are a member of the family of Brassicaceae or cabbage family that include Kale, *Nasturtium officinalis* (Watercress), broccoli, cabbage, Brussels sprouts and turnips. *Nasturtium officinale* are fast growing, aquatic or semi-aquatic, perennial plants native from Europe to central Asia, and one of the oldest known leaf vegetables consumed by human beings [5]. This herb is used to treat diabetes, bronchitis, and diuresis, as anti-ulcerogenic, treatment of scurvy, tuberculosis, influenza, asthma, nutritional supplement and digestive aid and also seems to have antimicrobial, anticarcinogenic, and antiestrogenic activity [6].

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N. officinalis contains oils, like mustard oil [7] and isothiocyanates such as phenylisothiocyanate that have cancer-preventive [8]. Glucosinolates like gluconasturtiin and carotenoids like lutein are also found in *N. officinalis* [9]. A high dietary intake of *N. officinalis* has been linked to a reduction in cancer [10] and reduces the DNA damage in white blood cells and increases the antioxidant uptake [11]. The crude extract of *N. officinalis* has demonstrated significant anti-genotoxic, anti-proliferative and anti-metastatic potential in human colon cancer cells [12], human oral cancer [5] and human MDA-MB-231 breast cancer cells [10]. Considering the phytochemical and pharmaceutical bioactive component of *N. officinalis* in medicinal use, little evidence exists showing the possible effects of *N. officinalis* on cancer cell line. However in this study, we evaluated the cytotoxic effect of the ethanolic extract of *N. officinalis* on Hela cell line.

MATERIALS AND METHODS

Cell culture

Hela (NCBI C115) cancer cell line was obtained from National Cell Bank of Iran (the Pasteur Institute of Iran, Tehran) and cultured in RPMI 1640 (purchased from PAA) supplemented with 10% FBS, 100 U/ml penicillin and 100 µg/ml streptomycin. They were incubated in a humidified atmosphere of 5% CO₂ and 95% air at 37 °C.

Collection of Plant material and preparation of ethanolic extract

The plant material was identified by Dr. Bahman Eslami (Assistant. Prof. of plant system, Islamic Azad University of Qaemshahr, Iran). Voucher specimens are deposited with the faculty of biology herbarium (as No 720 - 202). The leaves, stems and flowers were collected in the month of February and March 2013 from around Amol region (Latitude 36.26 N longitude 52.24 E). Aerial parts of the plant was thoroughly washed with water followed by shade dried at room temperature and powdered by using mortal pestle. The

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powdered plant material was percolated with ethanol (96%) for 3 days. The ethanolic extracts were then filtered and concentrated by indirect heat.

MTT assay

To evaluate the cytotoxicity effect of the ethanolic extract of *N.officinalis* on the HeLa cancer cells, MTT colorimetric assay was used. In short, cells (10000 cells/ml) were transferred into 96-well culture plates and incubated for 24 h. Then 100 μ l of various concentrations of extract of *N.officinalis* (10,7.5,5,2.5,1.25,0.625,0.312,0.156 mg/ml) were added and the micro plates were further incubated for 72 h. Dilution of stock solutions was made in culture medium with a final DMSO concentration of 0.1%. Untreated cancer cells was used as a positive control. For testing the effect of extract on normal cells, we use peripheral blood mononuclear cells at 1×10^4 /ml in RPMI 1640. After 72 hours, MTT assay was performed. In this assay mitochondrial enzyme of viable cells reduces metabolically the soluble MTT into an insoluble colored formazan product which in turn can be dissolved in DMSO and measured spectrophotometrically [13]. To evaluate cell survival, each well was incubated with 20 μ l of MTT solution (5 mg/ml in PBS) for 3 h and after removing of well content, DMSO was added to well and mixed to dissolve insoluble formazan crystals. Cells were incubated further to allow for color development, then the absorbance values were read at 492 nm using an ELISA plate (Awareness,USA) and was calculated using the equation: (mean OD of treated cells - OD blank/mean OD of control cells - OD blank) \times 100. Also the rates of IC₅₀ were measured.

Observation of morphological changes

Morphological changes in HeLa cells treated with the 1.25 mg/ml concentration of ethanolic extract were monitored under an inverted microscope (Motic AE 31, Australia) and compared with the control group after 72 h treatment.

Statistical Analysis

Data was expressed as mean \pm S.E.M. Statistical analysis was performed with Student's t-test using the independent t-test. Differences were considered significant at $P \leq 0.05$. The (Inhibition Concentration) IC₅₀ value was obtained from MTT assay and calculated using Microsoft excel software from linear regression analysis.

RESULTS

Cytotoxicity assay

To evaluate the cytotoxicity effect of the ethanolic extract of *N.officinalis*, viability tests were applied using MTT assay. [Table 1] shows the percentage of growth inhibition of the treated cells with different concentration of ethanolic extract of *N.officinalis* on HeLa cells line. The highest percentage of cell growth inhibition at 1.25 mg/ml concentration was 91.8% [Fig. 1 and Table 1] and the rate of IC₅₀ was measured as 0.305 mg/ml. The significant decrease in cell growth ($p \leq 0.05$) was observed for 0.625, 1.25, 2.5, 5, 7.5, 10 mg/ml, when compared to untreated control cells [Table 1]. Treating of normal cells with 10 mg/ml concentration of extract show significantly decrease in cell growth when compared with control group.

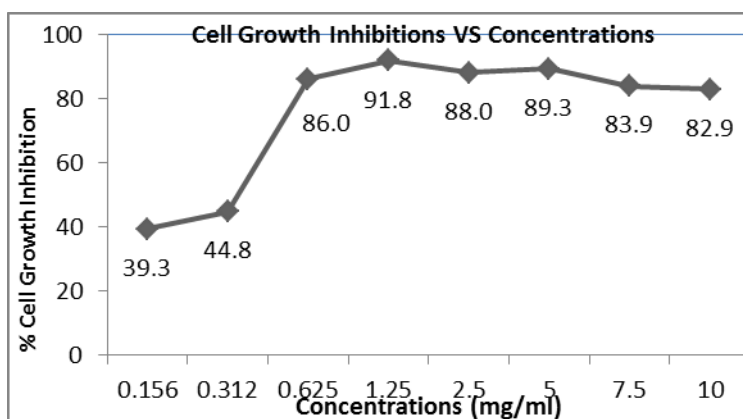


Fig. 1: Growth inhibition percentage of HeLa cells in different concentration of ethanolic extract of *N.officinalis*

Table 1: Cytotoxicity results of ethanolic extract of *N.officinalis* on Hela cell at different concentrations by MTT assay

Concentratipons of <i>N.officinalis</i> (mg/ml)	Absorbance (mean± sem)	Inhibition %	IC ₅₀ (mg/ml)
Control	0.257 ± 0.049		
0.156	0.172 ± 0.060	39.353	
0.312	0.151 ± 0.029	44.822	0.305
0.625	0.060 ± 0.013 *	86.079	
1.25	0.047 ± 0.014 *	91.080	
2.5	0.051 ± 0.003	88.038	
5	0.049 ± 0.002	89.311	
7.5	0.060 ± 0.008 *	83.931	
10	0.074 ± 0.016 *	82.999	
DMSO	0.224 ± 0.070	1.3	
Lymph	0.080 ± 0.005	75.27	

Morphological studies

The morphological changes were obtained comparison to control cells under the invert microscop (Magnification 200x)[Fig.2]. After 72h,the morphological characteristics of apoptotic cell death, such as cell shrinkage, condensation,vacuolation and pigmentation was observed.

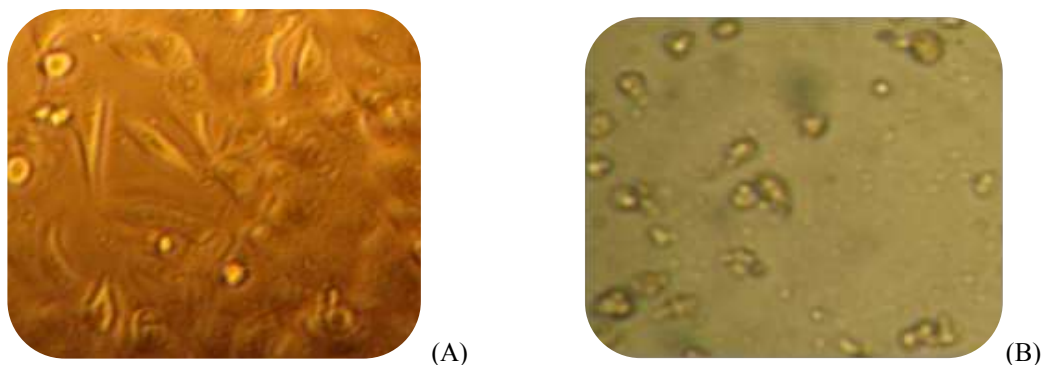


Fig.2: (A) Control Hela cells.(B) Hela cells treated with ethanolic extract of *N.officinalis* after 72h.Results revealed that morphological changes were typical of apoptosis

DISCUSSION

Cervical cancer is a malignant neoplasm of the cervical area. It is an important women's health problem in developing countries. Herbal medicines in all regions of the world are widely used for treatment of disease especially cancer. Today, more than 85000 plant species have been documented for medical use [14] . There have been several researches to get new cytotoxic agents. In this regard compounds such as Camptothecin, Taxol, Combretastatin, Podophyllotoxin, colchicine, Vinca alkaloids and paclitaxel isolated from medicinal plants showed considerable promises [15].To evaluate the cytotoxicity of one of native plants of Iran, this study was conducted. This in-vitro study was undertaken to demonstrate the effects of ethanolic extract of *N.officinalis* on Hela cells by MTT assay. we showed that treatment of the Hela cells with 0.625 , 1.25 , 2.5 , 5 , 7.5 , 10 mg/ml concentrations of ethanolic extract resulted in a significant ($p \leq 0.05$) increase in the cell death and the morphological characteristics of apoptotic cell death . Normal cells at 10 mg/ml concentrations of extracts were damaged.

Several studies on cytotoxic effects of *N.officinalis* in vitro and in vivo , are shown toxicity of this extract on cancer cells .A report by Rajalakshmi and Agalyaa showed antitumor activity of extract of *N.officinalis* on oral cancer. They showed that Phenethyl Isothiocyanate (PEITC) present in *N. officinale* acts as an chemo preventive agent and inhibit bind of PEITC to Cytochrome P450 [18].

Rose and et al have shown that a high dietary intake of cruciferous vegetables has been associated with a reduction in numerous human pathologies particularly cancer. They show that the ability of cruciferous vegetables to chemo prevention of cancer cells attributed to inhibit cancer cell proliferation, invasion , and metastatic potential [16].

Another group of active constituents of these plants are glucosinolates. The glucosinolates are a large group of sulphur-containing glucosides found in cruciferous vegetables. Glucosinolates are broken down to glucose and isothiocyanates (ITC). ITC, the most important products of broken glucosinolates, can prevent cancer by blocking DNA damage, inhibiting the growth of tumor cells, stimulating apoptosis, inhibiting mitosis, inducing cell cycle arrest, and promoting of apoptosis [17].

Previous studies have shown that ITCs can inhibit the NF-KB signaling pathway in several cancer cell and in animal model [18-21]. Moreover, another evidence from Zhu and et al has also demonstrated that the ITC sulforaphane can inhibit AP-1 DNA binding in human keratinocyte exposed to UV-B irradiation [22].

Carotenoids like β -carotene and lutein also present in these vegetables. Lutein in addition of protecting the retina from photooxidative damage, can prevent cancer. Lutein has also shown antimutagenic and anticarcinogenic invivo and invitro by regulating apoptosis [17].

In the present study, we showed cytotoxicity effect of ethanolic extract of *N.officinalis* on Hela cells. Also morphological characteristics of apoptotic cell death, such as shrinkage, condensation, vacuolation and pigmentation is observed. These results may be due to the presence of some bioactive compounds in this extract such as Glucosinolates , Phenethyl Isothiocyanate or carotenoids that leads to increased apoptosis in these cells. Therefore *N. officinalis* can be a natural potent chemopreventive and chemotherapeutic plant. Further studies are necessary to assess bioactive compounds of *N.officinalis* to improve the efficacy and testing on the other cell lines (human).Also further molecular studies need to elucidate the mechanisms of action of these extract on cancer cells.

CONFLICT OF INTEREST

There is no conflict of interest

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None

FINANCIAL DISCLOSURE

None

REFERENCES

- [1] Ashwini P, Krishnamoorthy M. [2001] Anticancer activity of *Trigonella foenum-graecum* Ehrlich Ascites carcinoma in *Mus musculus* system. *J Pharm Res* 3. 1181-1183.
- [2] Manju Kh, Jat RK, Anju G. [2012] A Review On Medicinal Plants Used As A Source Of Anticancer Agents . *International Journal of Drug Research and Technology*. 2 (2):177-183.
- [3] Valeriote F, Putten L. [1975] Proliferation-dependent cytotoxic action of anti-cancer agents. A review. *Cancer Res*. 2619-2630.
- [4] Mishra T, Khullar M, Bhatia A. [2011] Anticancer potential of aqueous ethanol seed extract of *Ziziphus mauritiana* against cancer cell lines and Ehrlich Ascites Carcinoma. *Evid Based Comple Alternat Med.*, 1155/2011/765029
- [5] Rajalakshmi PA, Agalyaa S. [2010] Docking Analysis Of Phenethyl Isothiocyanate (Peitc) From *Nasturtium Officinale* (Watercress), On 4 - (Methylnitrosamino) -1-(3 - Pyridyl) - 1- Butanone (Nnk), Carcinogenic Action In Oral Cancer .*International Journal of Pharma and Bio Sciences* .68.
- [6] Ozen T. [2009] Investigation Of Antioxidant Properties Of *NasturtiumOfficinale* (Watercress) Leaf Extracts. *Acta Poloniae Pharmaceutica n Drug Research*.66(2): 187-193
- [7] Nigam MC, Nigam IC, Levi L. [2012] Essential Oils and Their Constituents. *J. Soc. Cosmetic Chem.* 16:155-168.
- [8] Crichlow GV, Fan C, Keeler C, Hodsdon M, Lolis EJ. [2012] Structural interactions dictate the kinetics of macrophage migration inhibitory factor inhibition by different cancer-preventive isothiocyanates. *Biochem*. 51(38): 7506-14.
- [9] Barickman TC, Kopsell TA, Sams CE.[2009] Impact of nitrogen and sulfur fertilization on the phytochemical concentration in watercress, *Nasturtium officinal R. Br.* *J Biol.Chem.* 56(3):379-482.
- [10] Rose P, Huang Q, Ong CN, Whiteman M. [2005] Broccoli and watercress suppress matrix metalloproteinase-9 activity and invasiveness of human MDA-MB-231 breast cancer cells. *Toxicol. Appl. Pharmacol.* 209 (2): 105-13.
- [11] Gill Cl, Haldar S, Boyd LA, Bennett R, Whiteford J, et al. [2007]Watercress supplementation in diet reduces lymphocyte DNA damage and alters blood antioxidant status in healthy adults. *Am. J. Clin. Nutr.* 85 (2): 504-10.
- [12] Boyd LA, McCann MJ, Hashim Y, et al. [2006] Assessment of the anti-genotoxic, anti-proliferative, and anti-metastatic potential of crude watercress extract in human colon cancer cells. *Nutr. Cancer.* 55 (2):232-41.
- [13] Carmichael J, DeGraff WG, Gazdar AF, Minna JD, Mitchell JB. [1987] Evaluation of a tetrazolium-based semiautomated colorimetric assay: assessment of chemosensitivity testing. *Cancer Res*.47:936-942.

- [14] Liu Y, Wang MW. [2008] Botanical drugs: challenges and opportunities: contribution to Linnaeus Memorial Symposium. *Life Sci.* 82:445-449.
- [15] Van Uden W, Homan B, Woerdenbag HJ, et al. [1992] Isolatioc: Purification, a lignan from a root culture of *Linum flavum*. *J. Nat. Prod.* 55: 102-10.
- [16] Rosea P, Huangb Q, Ongb Ch N, Whiteman M. [2005] Broccoli and watercress suppress matrix metalloproteinase-9 activity and invasiveness of human MDA-MB-231 breast cancer cells. *Toxicology and Applied Pharmacology.* 111.
- [17] Johnson T. [2001] Glucosinolates in the human diet. Bioavailability and implications for health. *Phytochemistry Reviews.* 183-188
- [18] Heiss E, Herhaus C, Klimo K, Bartsch H, Gerhauser C. [2001] Nuclear factor kappa B is a molecular target for sulforaphane-mediated anti-inflammatory mechanisms. *Biol J. Chem.* 276: 32008-32015.
- [19] Jeong WS, Kim IW, Hu R, Kong AN. [2004] Modulatory properties of various natural chemopreventive agents on the activation of NFkappaB signaling pathway. *Pharm. Res.* 21:661- 670.
- [20] Murakami A, Matsumoto K, Koshimizu K, Ohigashi H. [2003] Effects of selected food factors with chemo preventive properties on combined lipopolysaccharide- and interferon-gamma-induced Ikappa B degradation in RAW264.7 macrophages. *Cancer Lett.* 195:17- 25.
- [21] Srivastava SK, Singh SV. [2004] Cell cycle arrest, apoptosis induction and inhibition of nuclear factor kappa B activation in anti-proliferative activity of benzyl iso thiocyanate against human pancreatic cancer cells. *Carcinogenesis.* 25: 1701- 1709.

ARTICLE

CYTOTOXIC EFFECT OF THE FLOWER AND LEAF BUD EXTRACT OF CRATAEGUS MICROPHYLLA C.KOCH ON HELA CELL LINE

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ABSTRACT

Background: *Crataegus microphylla* c.koch for having divers biological compounds, used in traditional medicine to treat different diseases. The aim of this study was to investigate potential antitumor activity of etanolic extract of flower and leaf bud of *C. microphylla* on Hela cell line and also to analyze its safety on human peripheral mononuclear cells. **Material and Methods:** Different concentrations of the extracts were added to the cultured cells and incubated for 72 h. Cell viability and growth inhibition was evaluated by morphologic observation and using MTT assay. **Results:** The results showed that the highest cell growth inhibition was observed in 1.25mg/ml. The IC50 value is 0.871mg/ml in Hela. At the same time, the extracts had no inhibitory effect on the normal human mononuclear cells. **Conclusion:** Based on the results it is determined that *C.microphylla* is a significant source of biologically active substances that have cytotoxic and antiproliferative activity and least cytotoxicity on normal cells. But further study are necessary to identification of the active ingredients of this extrac.

INTRODUCTION

KEY WORDS

Cytotoxicity, *Crataegus microphylla* c.koch, HeLa cell line, MTT assay.

Crataegus sp. Comprises of a complex group of trees and shrubs, that is widely distributed in Asia, Europe and North America. *Crataegus* belongs to the subfamily Maloideae in the Rosaceae, with approximately 280 species [1-3].

This plants has been used as a medicinal material and food for hundreds of years both in Europe and in China. In the traditional medicine system Hawthorn(refers to the plant *Crataegus*) fruit is used for the treatment of various ailments such as heart (cardiovascular disorders), central nervous system, immune system, eyes, reproductive system, liver, kidney etc. It also exhibits wide range of cytotoxic, gastro protective, anti-inflammatory, anti-allergic, anti-diarrheal, anti-HIV, antimicrobial, antioxidant and radical scavenging activities [4].

It has been reported that in different parts of hawthorn plants, there is several groups of phenolic compounds, including procyanidins, flavanols, flavonols, C-glycosyl flavones, phenolic acids, anthocyanins and lignans [5]. The medicinal parts of this plant are leaves, flowers, fruits, and flowering tops [6]. In fruits, oligomeric procyanidins and their glycosides are the major phenolic compounds, whereas flavonols, flavones glycosides and C-glycosyl flavones dominate in leaves [5].

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Triterpene acids are another group of bioactive compounds that have been suggested to be in hawthorn species. Evidence has shown that triterpene acids have beneficial effects such as anti-cancer activity (Hsu et al., 1997; Liu, 1995) [7, 8].

In Iran *Crataegus microphylla* C. Koch generally growth in Hyrcanian forests in north of Iran [9] and use in traditional and naturopathic medicine as a digestive aid, promotes blood circulation, and reduce blood stasis [10]. It also exhibits wide range of antioxidant and radical scavenging [11].

Previous preliminary studies have revealed that different members of the family of C.SPP (*C.monogina*, *C.pinnatifida*) possess cytotoxic effects against a number of tumor cells in vitro [12-14].

Currently, there are no data on cytotoxicity of any part of *C.microphylla*. Therefore the aim of this study was to investigate cytotoxicity potential of ethanolic extracts of aerial parts (flowers and leaf bud)of *C.microphylla* on Hela cell line and also to analyze its safety on normal cells we use human peripheral mononuclear cells.

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MATERIALS AND METHODS

Plant material

Collection and Identification

Flowers and leaf bud of *C. microphylla* were collected in May 2013 from the region of the kijaboof of sheykhusa in north of Babol. It was identified by Dr. Bahman Eslami.

Drying and grinding

The collected plant parts were air-dried in darkness at room temperature (20°C) for one week. Then cutting into small pieces, the plant part were ground into a fine powder with the help of a Hammer Mill. Fine powder was stored in an airtight container and kept in a cool, dark and dry place until analysis commenced.

Preparation of Eethanolic extract

About 80 gm of powered material was taken in a clean, flat bottomed glass container (2litres) and soaked in 1000 ml of 98% ethanol. The container with its contents was sealed and kept for a period of 3days accompanying occasional shaking and stirring. Then it was filtered through whatman filter paper and the filtrate was concentrated by using traditional spontaneous natural vaporization method at room temperature. Dry ethanolic extract were then dissolved in 100 µL DMSO .Different required dilutions were made by the cell culture medium(RPMI-1640).

Cell line

Hela cell line was purchased from Pasture Institute (Tehran, Iran). Cells were maintained in RPMI-1640 with 10% of fetal calf serum(of PAA compony) and penicillin/streptomycin (50 IU/ml and 50 µg/ml respectively),(of PAA compony) in an incubator for 24 h (37OC, 5% CO₂). Cells were harvested using 0.25% trypsin (of jibco compony) at 70 to 80% confluence in culture flasks [15]. and after a few passages cells were seeded in 96-well plate.

Cell viability assay (MTT assay)

Hela cells and normal blood lymphocytes and monocytes cell were seeded in a 96-well plate (10000 cells per well). After 24 h of cells incubation, the medium was replaced with 100 µL medium containing various doses of ethanolic extracts of *C.microphylla* at different concentrations (.156, .312, , .625, 1.25,2.5,5,7.5,and 10 mg/ml) for 72 h. The same Hela cell, cultured in medium with no treatment,served as control group. After 72 h of treatment, the cells were observed under the light inverted microscope for morphological alterations. Cell viability was determined by MTT(of sigma compony) assay [16]. This assay is based on the metabolic reduction of soluble MTT by mitochondrial dehydrogenase enzyme activity of viable cells into an insoluble colored formazan product, which can be measured spectrophotometrically after dissolving in DMSO (17). At the end of the treatment period, MTT (final concentration 5 mg/mL PBS) was added to each well, which was then incubated at 37 °C in 5% CO₂ for 2–4 h. The colored crystals of produced formazan were dissolved in 100 µL DMSO. The absorbance was measured at 492 nm on by an ELISA plate reader.

The percentage growth inhibition was calculated using following formula,

$$\% \text{cell inhibition} = 100 - \{ (At - Ab) / (Ac - Ab) \} \times 100$$

Where,

At=Absorbance value of test compound

Ab=Absorbance value of blank

Ac=Absorbance value of control

The IC₅₀ (Inhibitory concentration) is the concentration of the toxic compound that reduces the biological activity by 50%.

Observation of morphological changes

Cells plated in 96-well culture plates (10000 cells per well) in RPMI supplemented with 10% FBS for 72 hours were treated with or without flower and leaf bud extracts of *C. microphila* at various concentrations. After 72 h, the cells were observed under the inverted microscope (motic ae31) and photographs were taken.

Statistical analysis

The data is expressed as means ± SEM. Biological activity was examined in three individual experiments, performed in triplicate for each dose. Statistical significance was determined using the Student's t-test. Differences were considered to be a statically significant when $P < 0.05$ and $P < 0.01$. The IC₅₀ value was obtained from MTT assay and calculated using Microsoft excel software from linear regression analysis.

RESULTS

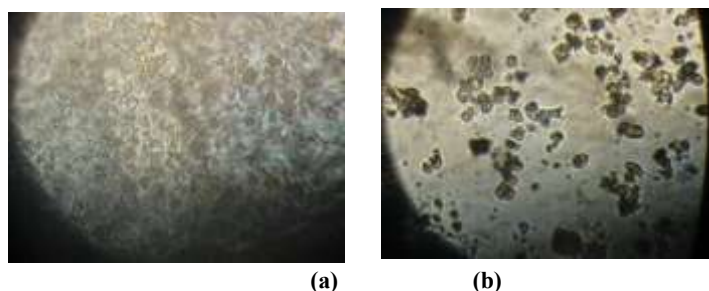


Fig. 1: (a) Control HeLa cells. (b) HeLa cells treated with *C. microphylla* flower and leaf bud extract after 72 h. Results revealed that morphological changes were typical of apoptosis (Magnification 200X)

This experiment investigated the cytotoxic activity of the ethanolic extract of flower and leaf bud of *C. microphylla* in various concentrations (0.156, 0.312, 0.625, 1.25, 2.5, 5, 7.5, 10 mg/mL) by MTT assay method in HeLa cell lines. The growth inhibition and morphological changes were compared with untreated cells. Decrease in cell viability and increase in growth inhibition was observed after 72 h of treatment. The cell growth was significantly lower ($p < 0.05$, $p < 0.01$) when compared to untreated control cells [Table 1]. This significant decrease in cell growth was observed for all concentrations.

The highest percentage of growth inhibition at concentrations of 1.25 mg/ml was % 85.741 for HeLa cells and the Inhibitory Concentration (IC_{50}) value was 0.871 mg/ml.

On treating the normal blood lymphocytes and monocytes, with 10 mg/ml of extract of the flower and leaf bud of *C. microphylla*, there was no significant decrease in cell viability.

After 72 hours, cell population decreased compared with the control group. Certain degree of morphological changes were observed under the inverted microscope [Fig. 1(a) and (b)]. Results revealed that morphological changes were typical of apoptosis. As the concentration increased from 0.156 to 10 mg/ml, there was more number of dead cells. The apoptotic cells appeared round in shape

and had detached from the surface and intercellular disruption, vacuolation, and pigmentation were apparent at all concentrations.

Table 1: The cytotoxic effect of ethanolic extract of flower and leaf bud of *C. microphylla* on HeLa cells, after 72 h exposure. The effect was measured by MTT cell viability assay. The data are mean \pm SEM of three independent experiments

Concentration <i>Crataegus microphylla</i> mg/ml	Observation	%Cell growth inhibiting	IC_{50} mg/ml
0.156	0.542 \pm .0063*	31.004	
0.312	0.541 \pm .012*	27.245	
0.625	0.540 \pm .027*	31.579	0.0871
1.25	0.184 \pm .0027**	85.741	
2.5	0.236 \pm .014**	74.614	
5	0.279 \pm .009**	69.16933	
7.5	0.254 \pm .022**	72.18	
10	0.227 \pm .009**	79.792	
Control	0.770 \pm .0322		

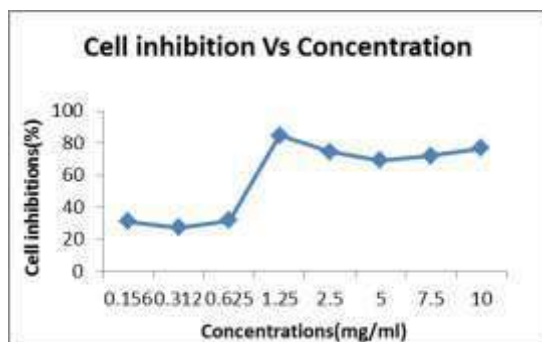


Fig. 2: Effect of leaf and flower bud extract of *C. microphylla* on HeLa cells. The highest percentage of growth inhibition at concentrations of 1.25mg/ml was % 85.741

DISCUSSION

Cancer is considered as the serious health problem worldwide and medicinal plants represent a vast potential resource for anticancer compounds [18]. There are various medicinal plants reported to have anti-cancer activity but they are toxic to normal cells and cause immunotoxicity [19]. Finding of new antitumor drug with low side effects on immune system have guided the investigators to consider more herbal medicine to be tested in many studies of immunopharmacology [20].

In this research, the cytotoxic effect of flower and leaf bud extract of *C. microphylla* in different concentrations (10, 7.5, 5, 2.5, 1.25, 0.625, 0.312, 0.156 mg/ml) was studied.

The results of cytotoxic assays of different concentrations of *C. microphylla* on HeLa showed significant cytotoxicity in all the concentrations [Table 1]. The highest cytotoxicity of this extract against HeLa cell was found in 1.25 mg/ml concentration with 85.741 percent of cell growth inhibition (Diagram 1). And also this extract did not have any cytotoxic effect on normal (lymphocyte and monocyte) cells. The approximate concentrations of the extracts to reduce viability of the cells to about 50% (IC₅₀) showed for HeLa 0.871 (mg/ml).

Our study showed that ethanolic extract of flower and leaf bud of *C. microphylla* has an in vitro inhibitory effect on the proliferation of human cervical cancer cell line.

The results indicate that *C. microphylla* is considered to be a particularly valuable source of effective anti-proliferative and cytotoxic substances.

In studies of quantitative composition of secondary metabolites from *C. microphylla* has indicated that the main compounds are flavonoids, triterpene, saponins, organic acids, and amines [10]. this kind of valuable secondary metabolites can cause major inhibitory effects on the growth of cancer cells.

Previous research of *C. microphylla* in turki [21] and Iran [11] has indicated high concentration of phenolic compounds, responsible for high antioxidative and soybean lipoxigenase activity.

Our results are in agreement with the findings of other researchers. Kao and et al has shown that polyphenols derived from the fruit of *Crataegus pinnatifida* have anti-tumor activities on skin [12]. Min and et al, has shown that trieterpens derived from *Crataegus pinnatifida* exhibited potent cytotoxic activities both in murine and in human cancer cell lines [13].

Sandra and et al identified that flower bud extract of *crataegus monogyna* showed high anti proliferative activity in MCF-7, NCL-H460, HeLa, HepG2 cell line. They show that flavonoid, particularly flavonols and flavones were the main compound in flower buds. They conclude that the high bioactivity observed in flower buds might be related with its high content in phenolic compounds [14].

Flavonoid anticancer activities include inhibition of cell growth, inhibition of protein kinase activities, induction of apoptosis [22]. Based on these arguments, we can conclude that the high concentration of phenolics and flavonoids is most likely responsible for the significant cytotoxic activity of ethanolic extract of flower and leaf bud of *C. microphylla*.

Another group of active constituents of this species are Triterpenoids. Triterpenoids exert a plethora of biological activities including suppression of inflammation, reduction of oxidative stress, regulation of cell cycle, inhibition of cell proliferation, induction of apoptosis, and interaction with tumor microenvironment through modulation of multiple signal transduction pathways. Therefore, this could explain, at least in part, antineoplastic properties of flower and leaf bud extract of *C. microphylla* in HeLa but it is well known that tumor cells use multiple survival pathways to prevail over their normal counterparts [23].

These results represent the first report on cytotoxicity of this plant, therefore it is indicated to continue investigation of cytotoxicity on other cancer cell lines and *in vivo* tests on animal model.

CONCLUSION

In conclusion, the results of *in-vitro* antitumor activity revealed that flower and leaf bud extract of *C. microphylla* exhibits good antitumor activity. The best antitumor activity by this extract was shown at 1.25 mg/ml concentration. The anticancer activity of this extract has not been reported in the literature. The IC₅₀ value was found to be 0.0871 mg/ml. Additionally, it was revealed that there is valuable bioactive compound in this extract, showing its anticancer potential and relative non-toxicity to the normal healthy lymphocytes and monocytes. Thus, further research should be carried out to isolate and identify biologically active substances from *C. microphylla*, with an anti proliferative activity.

CONFLICT OF INTEREST

There is no conflict of interest

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None

REFERENCES

- [1] Robertson KR. [1974] The genera of Rosaceae in the southeastern United States. *J Arnold Arboretum* 55: 303B-332, 334B-401, 611B-662.
- [2] Donmez AA. [2004] The genus *Crataegus* L. (Rosaceae) with special reference to hybridisation and biodiversity in Turkey. *Turk J Bot* 28: 29-37
- [3] Huang Y, Chen ZY, Ho WKK. [2004] *Crataegus* (Hawthorn). In: Lester P, Choon NO, Barry H, *Herbal and traditional medicine, biomolecular and clinical aspects*. China 21 CRC Press DOI: 10.1201/9780203025901.ch21.
- [4] Dinesh K, Vikrant A, Zulfiqar Ali B, Nisar Ahmad K, DeoNandan P. [2012] The genus *Crataegus*: chemical and pharmacological perspectives, *Revista Brasileira de Farmacognosia Brazilian Journal of Pharmacognosy*. 22(5): 1187-1200.
- [5] Liu P, Yang B, Kallio H. [2011] Phenolic Compounds in hawthorn (*Crataegus grayana*) fruits and leaves and changes during fruit ripening. *Journal of Agricultural and Food Chemistry*. 59 (20): 11141-11149.
- [6] Liu P. [2012] Composition of HAMTHORN (*crataegus* spp.) FRUITS AND LEAVES AND EMBLIC LEAFFLOWER FRUITS. Department of biochemistry and food chemistry and functional Foods form university of Turku. 6(90): 90-97.
- [7] Hsu HY, Yang JJ, Lin CC. [1997] Effects of oleanolic acid and ursolic acid on inhibiting tumor growth and enhancing the recovery of hematopoietic system postirradiation in mice. *Cancer Letters*. 111(1): 7-13
- [8] Liu J. [1995] Pharmacology of oleanolic acid and ursolic acid. *Journal Ethnopharmacology*. 49(2): 57-68.
- [9] Amin GR. [2005] Popular Medicinal Plants of Iran. Tehran University of Medical Sciences. 300
- [10] Ali Akbar Tajali. [2012] Mehrdad Khazaeipool2 Effects of height and organs on flavonoids of *Crataegus microphylla* C. Koch in Iran, *International Journal of Biosciences(IJB)*. 2(7):54-58.
- [11] Hosseinimehr SJ, Azadbakht M, Mousavi SM, Mahmoudzadeh A, Akhlaghpour S. [2007] Radioprotective effects of hawthorn fruit extract against gamma irradiation in mouse bone marrow cells. *J Radiat Res*. 48: 63-67.
- [12] Kao ES, Wang CJ, Lin WL, Chu CY, Tseng TH. [2007] Effects of polyphenols derived from fruit of *Crataegus pinnatifida* on cell transformation, dermal edema and skin tumor formation by phorbol ester application. *Food Chem Toxicol*. 45: 1795-1804.
- [13] Min BS, Kim YH, Lee SM, Jung HJ, et al. [2000] Cytotoxic triterpenes from *Crataegus pinnatifida*. *Arch Pharm Res*. 23: 155-158.
- [14] Sandra Rodrigues. [2012] *Crataegus monogyna* buds and fruits phenolic extracts: Growth inhibitory activity on human tumor cell lines and chemical characterization by HPLC-DAD-ESI/MS, *Food Research International*. 49(1): 516-523.
- [15] Le HK, Graham L, Cha E, Morales JK, Manjili MH, Bear HD.: Int. [2009] *Immunopharmacol*. 9- 900 .
- [16] Mosmann T. [1983] Rapid colorimetric assay for cellular growth and survival Application to proliferation and cytotoxicity assays, *Journal of Immunological Methods*. 65: 55-63.
- [17] Carmichael J, DeGraff WG, Gazdar AF, Minna JD, Mitchell JB. [1987] Evaluation of a tetrazolium-based semiautomated colorimetric assay: assessment of chemosensitivity testing. *Cancer Res*. 47:936-942.
- [18] Gandhiappan J, Rengasamy R. [2012] Antiproliferative activity of *Solanum anguivi* against cancer cell lines, *Der Pharmacia Lettre*. 4 (3):875-880.
- [19] Udhayasankar MR, Danya U, Punitha DK. [2013] Arumugasamy1 *In vitro* cytotoxic activity of methanolic extract of *Cardiospermum canescens* Wall. (Sapindaceae) Research in Pharmacy 3(3): 01-05, 2013 ISSN : 2231-539X
- [20] Xu H, Yao L, Sung H, Wu L. [2009] Chemical composition and antitumor activity of different polysaccharides from the roots *Actinidia eriantha*. *Carbohydr. Pol*. 78: 316-322.
- [21] Mlikoglu G, Bitis L, Mericili AH. [2004] Flavonoids of *Crataegus Microhila* .*Nat Prod Res*. 18(3): 211-30.
- [22] Kandaswami C, Lee LT, Lee PP, et al. [2005] The antitumor activities of flavonoids. *US National Library of Medicine National Institutes of Health* 19(5):895-909.
- [23] Anupam Bishayee, Shamima Ahmed, Nikoleta Brankov, Marjorie Perloff. [2011] Triterpenoids as potential agents for the chemoprevention and therapy of breast cancer *Front Biosci*. 1(16): 980-996.

ARTICLE

CYTOTOXIC EFFECT OF TiO_2 NANOPARTICLES ON BREAST CANCER CELL LINE (MCF-7)

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ABSTRACT

The aim of this study was to evaluate the cytotoxic effects of TiO_2 Nanoparticles on MCF-7 Breast cancer cell line and human white blood cells (WBC) *in vitro* was examined. The cells were cultured in RPMI1640 liquid medium with 10% inactivated fetal bovine serum (FBS) and antibiotics; and were cultured with various concentrations of TiO_2 Nanoparticles (20, 50, 80, 110, 140, 170 and 200 $\mu\text{g/ml}$) for 24, 48 and 72 hours and were analyzed using the MTT test. The absorbance was then determined by ELISA reader at 570 nm. The percentage growth inhibition was calculated. The data were analyzed using SPSS software. Results showed that TiO_2 Nanoparticles, had weakly inhibitory effect on MCF-7 cell line, after 24h incubation (from 0.58 to 3.00%). After 48h incubation, results showed significant effect on MCF-7 cell in concentrations of 140, 170 and 200 $\mu\text{g/ml}$ compared with control, with 27.03, 41.30 and 56.33 percent of cell growth inhibition respectively ($p < 0.05$). Also, the TiO_2 Nanoparticles at 110 $\mu\text{g/ml}$ and upper doses, suppressed the proliferation of cancerous MCF-7 cells by significant difference with control group, after 72h incubation ($p < 0.05$). Maximum inhibitory effects were found at 200 $\mu\text{g/ml}$ (84.58%). In the other hands, results showed significant effect on WBC cells in concentration of 200 $\mu\text{g/ml}$ compared with control, after 72h with 25.59% of cell growth inhibition ($p < 0.05$). Overall, results showed the TiO_2 Nanoparticles dose and time-dependently suppressed the proliferation of MCF-7 cells.

INTRODUCTION

KEY WORDS
Cytotoxic effect,
Titanium Dioxide
nanoparticles, MCF-7
cancer cell lines, MTT
test

Now a day cancer is the second most common cause of death in the world. Breast cancer is the most common malignancy among women and the most frequent cause of female cancer deaths after lung and stomach cancers. An estimated 40,430 breast cancer deaths (40,000 women, 430 men) are expected in 2014 [1]. According to reports of the Iranian Ministry of Health and Medical Education (MOHME), cancer is the third cause of death in following coronary heart disease and accidents [2]. Despite a marked decrease in mortality rate of breast cancer, especially developed countries, it is still a major challenge for health policy making in developing countries such as Iran. In Iran, breast cancer ranks first among female cancers comprising 24.4% of all malignancies in women [3].

Treatment of patients with breast cancer remains a clinical challenge due to the disappointing effects of most chemotherapies. The efficacy of chemotherapy is limited and patients have to suffer from serious side effects, some of which are life-threatening. Therefore, focus is now towards controlled and targeted drug delivery systems. Nanoparticles can provide a controlled and targeted way to deliver the encapsulated anticancer drugs and thus result in high efficacy with low side effects [4]. Hence we need to find new materials for treatment and cure. Nanoparticles and molecules are a potential alternative for treatment of disease because of their unique biological effect.

Titanium dioxide (TiO_2) nanoparticles has been increasingly employed in a variety of industrial applications including production of paper, plastics, cosmetics, and paints. Also the photocatalytic properties of TiO_2 have led to extensive research into its potential uses as a disinfectant, antibiotic, biological sensor, tumor cell-killing agent, and gene targeting device [5].

Thevenot et al. [6] was examined the non photocatalytic anticancer effect of TiO_2 on *in vitro* survival of several cancer and control cell lines. They confirmed that the cell viability depend on particle concentrations and suggested that TiO_2 nanoparticles can be surface-engineered for targeted cancer therapy.

This paper deals with the influence of the TiO_2 nanoparticles on MCF-7 cell line and white blood cells growth inhibition, at various concentrations and for various treatment periods *in vitro*. MCF-7 cell line was selected since breast cancer is one of the most common tumors found worldwide. Furthermore, in the primary malignancy of the breast this cell line has been widely used as the human breast cancer model cell line in the development of new anti-tumor medicines. The aim of the study is to use *in vitro* studies to evaluate the cytotoxicity activity of TiO_2 nanoparticles. This further helps to find the appropriate anti-cancer medicine for *in vivo* studies.

MATERIALS AND METHODS

Suspensions preparation and Characterization of TiO_2 nanoparticles

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TiO₂Nanoparticles, with partial size 10-25 nm, were purchased from P25-DEGUSSA company, Germany (Nano-Rahpouyane Mahan Iranian company). Purified TiO₂Nanoparticles were characterized for Morphology, Particle size, zeta potential and polydispersity index (PDE). Morphology was determined by Scanning Electron Micrograph (SEM), particle size (Photon Correlation Spectroscopy), Zeta potential and PDE using zeta sizer (Delsi Nano,C, Beckman Coulter). TiO₂anoparticles were suspended in ultrapure water, sonicated (1min) and diluted in cell culture medium to optimize suspension stability.

Evaluation of in vitro cytotoxic activity of the TiO₂nanoparticles on cell lines

The cytotoxicity of TiO₂Nanoparticles on MCF-7 cell line and white blood cells was determined by the MTT assay. Cells were seeded in 96-well tissue culture plates. Stock solutions of TiO₂Nanoparticles (5 mg/ml) were prepared in sterile distilled water and diluted to the required concentrations (20, 50,80,110, 140, 170and 200 µg/ml) using the cell culture medium.

Cell cultures

MCF-7 cancer cell line were purchased from Pasteur Institute of Iran (NCBI C135). The cells was grown and maintained in a humidified incubator at 37 °C and in 5% CO₂ atmosphere. RPMI-1640 medium (SIGMA) was supplemented with 0.01 mg/ml heat inactivated Fetal Calf Serum (FCS), 100 units/ml penicillin, and 100 µg/ml streptomycin (ALL FROM INVITROGEN GIBCO) was used for cell cultures. Upon reaching confluency, the cells were passaged. After being harvested from sterile T75 culture flasks, the cells were counted using a hemocytometer and cell viability was determined by trypan blue exclusion. Three thousand cells from log phase cultures were seeded in 100 µl of RPMI medium supplemented with 10% fetal bovine serum per well of 96-well flat-bottom culture plates. Cells were incubated with the TiO₂Nanoparticles solution for a defined time (72 hours). Proliferative response and cell death of the TiO₂Nanoparticles treated cells were determined using MTT assay and cell death ELISA Cell Viability Assay, respectively.

MTT Cell viability assay

Growth of tumoral cells quantitated by the ability of living cells to reduce the yellow dye 3-(4,5-dimethyl- 2-thiazolyl)-2,5-diphenyl-2H-terazolium bromide (MTT) to a blue formazan product. At the end of 24, 48 and 72 hours incubation, the medium in each well was replaced by MTT solution. 20 µl of MTT solution (5 mg/mL) in phosphate buffer saline (1/10 of total volume in a well) was added to wells. Then, the plates were incubated for 4 hours under 5% CO₂ and 95% air at 37°C. MTT reagent was removed and the formazan crystals produced by viable cells were dissolved in 100 DMSO and gently shaken. The absorbance was then determined by ELISA reader at 570 nm. The percentage growth inhibition was calculated using following formula,

$$\% \text{ cell inhibition} = 100 - [(At - Ab) / (Ac - Ab)] \times 100$$

Where, At = absorbance value of test compound, Ab = Absorbance value of blank and

Ac = Absorbance value of control.

The effects of TiO₂Nanoparticles were expressed by IC₅₀ values (the drug concentration reducing the absorbance of treated cells by 50% with respect to untreated cells).

Statistical Analysis

The data are expressed as mean ± standard deviation (SD) for at least three independent determinations in triplicate for each experimental point. The data were analyzed using IBM SPSS Statistics 20 software. For all the measurements, one-way ANOVA followed by Duncan's New Multiple Range Test ($P \leq 0.05$) was used to assess the statistically significance of difference between control and treatments.

RESULTS

Cell growth inhibition Analysis of TiO₂Nanoparticles (MTT Assay)

In this study, the growth of human MCF-7 cell line were treated with various concentrations of TiO₂ nanoparticles ranging from 20 to 200 µg/ml, and the cell growth inhibition was measured by the MTT assay. The experimental data are summarised in [Table 1] with data presented as mean values ± standard deviations.

Results showed that cell growth inhibition was induced in a time-dependent manner after 24, 48 and 72h exposure of human MCF-7 cell line to nanoparticles using the MTT assay, and as the concentration of TiO₂ nanoparticles is increased from 20 to 200 µg/ml, the cell viability decreased, in a dose-dependent manner.

After 24 h, the various concentrations of TiO₂ nanoparticles had not significant suppression on the proliferation of MCF-7 cell line. The cell growth inhibition of MCF-7 cell line significantly decreased after 48h exposure to TiO₂nanoparticles of concentrations 140, 170 and 200 ($P < 0.05$) with 27.03, 41.30 and 56.33 percent of inhibition respectively. Also, after 72h incubation, the MTT assay of TiO₂Nanoparticles

showed significant effect on MCF-7 cell in concentration of 80 $\mu\text{g/ml}$ and upper doses compared with control and the value of cell growth inhibition percentage were 67.15, 71.89, 74.60, 83.44 and 84.58, respectively ($P < 0.05$). The highest cytotoxicity of this solution against MCF-7 cell was obtained 84.58 percent of cell growth inhibition by 200 $\mu\text{g/ml}$ after 72h [Table 1].

The IC₅₀ value for TiO₂ nanoparticles after 24h is 163.7 $\mu\text{g/ml}$, after 48h is 7.16 $\mu\text{g/ml}$ and after 72h is 6.73 $\mu\text{g/ml}$. As seen, when the time of incubation increases, the IC₅₀ values decreases (Table 1). Overall, after exposure to TiO₂, a time- and dose-dependent significant increase in cell growth inhibition, with MTT test [Fig.1] was observed.

The white blood cell viability for TiO₂ nanoparticles of 200 $\mu\text{g/ml}$ after 24, 48 and 72h incubation are given in Figure 2. Results showed that white blood cell viability were 73.94, 63.33 and 74.40% after 24, 48 and 72h incubation, respectively [Fig. 2]. After 48 h incubation with TiO₂ nanoparticles had shown more suppression effect on the viability of white blood cells as a comparison with the control group (63.33 %) ($P < 0.001$).

Table 1: Cytotoxicity activity of TiO₂ NPs against MCF-7 cell line and white blood cells at different concentrations by MTT assay. Values represent the mean of three experiments.

Concentrations of TiO ₂ NPs ($\mu\text{g/ml}$)	Absorbance	Inhibition (%)	IC ₅₀ ($\mu\text{g/ml}$)	SEM	P-value
After 24h incubation					
Control of WBC	0.454 \pm 0.017	-		0.017	-
WBC	0.358 \pm 0.018	26.064 \pm 0.046		0.033	0.066
Control	0.155 \pm 0.012	-		0.008	-
20	0.153 \pm 0.001	0.580 \pm 0.141		0.100	0.819
50	0.152 \pm 0.037	0.620 \pm 0.504		0.365	0.924
80	0.151 \pm 0.025	0.858 \pm 0.456		0.322	0.864
110	0.152 \pm 0.010	1.095 \pm 0.272		0.192	0.828
140	0.151 \pm 0.034	1.411 \pm 0.495		0.350	0.890
170	0.151 \pm 0.023	1.885 \pm 0.419	163.7	0.296	0.841
200	0.152 \pm 0.017	3.003 \pm 0.224		0.158	0.811
After 48h incubation					
Control of WBC	0.271 \pm 0.010	-		0.007	-
WBC	0.187 \pm 0.006	36.674 \pm 0.004**		0.002	0.001
Control	0.097 \pm 0.005	-		0.0004	-
20	0.089 \pm 0.016	14.938 \pm 0.245	7.166	0.173	0.475
50	0.089 \pm 0.015	15.300 \pm 0.236		0.167	0.463
80	0.085 \pm 0.012	21.754 \pm 0.194		0.137	0.252
110	0.085 \pm 0.006	22.605 \pm 0.088		0.062	0.074
140	0.082 \pm 0.004	27.038 \pm 0.070*		0.049	0.029
170	0.074 \pm 0.001	41.307 \pm 0.009**		0.006	0.0006
200	0.066 \pm 0.013	56.332 \pm 0.194*		0.137	0.033
After 72h incubation					
Control of WBC	0.380 \pm 0.009	-		0.006	-
WBC	0.294 \pm 0.074	25.597 \pm 0.164		0.116	0.599
Control	0.335 \pm 0.069	-		0.049	-
20	0.205 \pm 0.004	41.726 \pm 0.086	6.730	0.061	0.081
50	0.197 \pm 0.039	44.577 \pm 0.158		0.111	0.114
80	0.137 \pm 0.028	67.154 \pm 0.040*		0.028	0.014
110	0.120 \pm 0.008	71.899 \pm 0.041*		0.029	0.028
140	0.111 \pm 0.007	74.606 \pm 0.051*		0.036	0.034

170	0.086 ±0.004	83.443 ±0.038*	0.027	0.025
200	0.082 ±0.002	84.585 ±0.024*	0.017	0.025

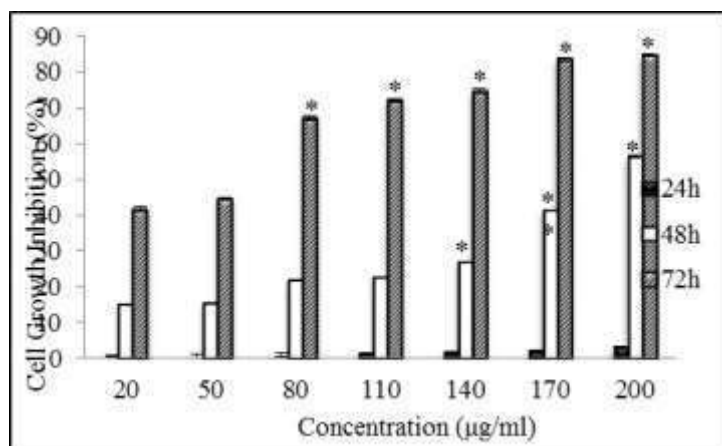


Fig. 1: Effect of different concentrations of TiO₂ NPs against MCF-7 cell line in 24, 48 and 72 h

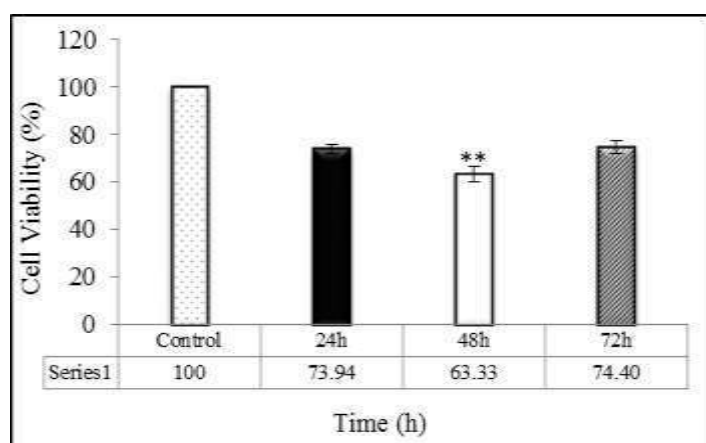


Fig. 2: Effect of TiO₂NPs (200 µg/ml) on viability of white blood cell in 24, 48 and 72

DISCUSSION

TiO₂ nanoparticles are widely used for industrial and medical applications [7, 8]. Since nanoparticles can interact with cell membranes and intracellular organelles in a manner not totally understood, there are increasingly concerns about the adverse health effects of TiO₂ and other nanoparticles. The use of *in vitro* assays of cellular viability in different cancer cell lines is essential for evaluating the potential toxicity of the nanoparticles to discovery of cancer medicines [9]. In this study, we employed toxicity studies based on MTT method. It was seen that TiO₂ nanoparticles induced a massive toxicity in MCF-7 cell line at 72 hours. Also, the present study showed that TiO₂ nanoparticles may be an alternative chemotherapeutic agent for treatment of cancer and with higher nanoparticle concentrations and longer exposure times the percentage of cell growth inhibition increased.

The mechanism of cytotoxicity induced by TiO₂ nanoparticles is also of scientific interest to researchers. For example Lozano et al. [9] reported this could be due to either the presence of small aggregates formed by TiO₂ nanoparticles, which could have greater interaction with the cell causing its death.

Also some researchers reported that TiO₂ particle-mediated tissue toxicity is potentially via particle:cell interactions, presumably related to the surface properties of the TiO₂ particles [10]. It has been reported in several *in vivo* studies that TiO₂ can migrate in the bloodstream via binding to plasma proteins, through the lymphatic system after phagocytosis by macrophages, or to the bone marrow via monocytes [11, 12]. The specific interactions between TiO₂ particles and proteins are not well understood. Studies have revealed that TiO₂ particles have a net negative charge (at pH = 7) [13] and also bind preferentially to amino acids containing -OH, -NH, and -NH₂ in their side chains [14]. These findings indicate that TiO₂ particles may react with cell membrane proteins and contribute to cell:particle interaction.

There are several studies on mechanism of toxicity of nanomaterials which have shown that oxidative stress, lipid peroxidation and reaction of DNA with ROS has an important role on DNA damage, destruction of membrane and finally cell death [15, 16, 17, 18]. Nanomaterials play an significant role in DNA damage, membrane destruction and finally cell death via oxidative stress and lipid per-oxidation [19], which can develop effective circumstances to destroy tumor with least side effects [20]. Among nanomaterials, TiO₂ is a biocompatible agent which causes inflammation in nano-domain [19], and leads to cell toxicity by super-oxide, H₂O₂ and free hydroxyl radical formation in mammals [20]. Increasing free radicals due to induction of oxidative stress activates necrosis and apoptosis reactions and finally leads to cell death [18, 21]. TiO₂ is a biocompatible material which in nano size causes some inflammatory effects [15]. Some evidence showed that nano-TiO₂ causes H₂O₂ and hydroxyl free radical formation which result to cell toxicity in mammals [19, 20, 21]. This nanoparticle interacts with water molecules in cell medium and using electron capture pathway, produces free radicals specially ROS [22]. The exact mechanism of free radical production by TiO₂ has not determined yet, but several studies have shown that this crystals aggregate in mitochondria and cause some defect in electron chain and destruct its function. This leads to more and more production of free radicals.

Rezaei-Tavirani et al. [23] findings support that TiO₂ nanoparticles has a high effect on the breast cancer cell line. There exists a wide variety of literature on cytotoxicity induced by TiO₂. These include fibroblast and epithelial cells [24, 25], kidney cells [26], neuroblast cells [25] and endothelial cells [27]. All of these studies relate this toxicity to ROS production. Some studies consider synergistic effect of UV radiation and TiO₂ nanoparticles on several cells such as CHO [28], glioma [29] and HeLa [30]. These studies relate the enhanced cytotoxicity to the capability of this nanoparticle to react with water molecule in cell medium and yield ROS via electron capture pathway.

Several authors have investigated the cytotoxic effects of TiO₂ nanoparticles on white blood cells. In particular, the cytotoxic effects of P25 Degussa TiO₂ nanoparticles were studied on human peripheral blood lymphocytes by king et al [21] that reported a dose- and time-dependent reduction in cell viability. In this investigation cell viability decreased from 73.94 to 63.33% after 24 to 48h in a time-dependent, but after 72h the cell viability rebounded to 74.40%. Also in a subsequent study [31], the same researchers found that P25 Degussa TiO₂ nanoparticles caused apoptosis of human peripheral blood lymphocytes. Similar effects were also observed in macrophage cell lines, particularly a decrease in cell viability and an increase in apoptosis [32].

In conclusion, this study represents a novel observation on influence of TiO₂ particles on cancer cell death. These interesting results suggest that TiO₂ nanoparticles may provide a degree of toxicity based on the interactions between the time and it's concentrations. However, more studies are needed to elucidate the effects of TiO₂nanoparticles, and to clarify the mechanisms of the TiO₂ nanoparticles toxicity on cells, with the aim of developing new strategies for the treatment of cancer and other illness.

CONFLICT OF INTEREST

There is no conflict of interest

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FINANCIAL DISCLOSURE

None

REFERENCES

- [1] American Cancer Society. [2014] Global Cancer Facts & Figures 2nd Edition. Atlanta: American Cancer Society.
- [2] Goya M. [2007] Iranian Annual Cancer Registration Report 2005/2006. Tehran: Center for Disease Control and Prevention, Iranian Ministry of Health and Medical Education.
- [3] Sadjadi A, Nouraie M, Ghorbani A, Alimohammadian M, Malekzadeh R. [2009] Epidemiology of breast cancer in the Islamic Republic of Iran: first results from a population-based cancer registry. *East mediterr Health J*, 15: 1426-31.
- [4] Lifeng Q, Xu Z, Chen M. [2007] In vitro and in vivo suppression of hepatocellular carcinoma growth by chitosan nanoparticles. *European Journal of Cancer*. 4 (3): 184 -193.
- [5] Wang JJ, Sanderson BJ, Wang H. [2007] Cyto- and genotoxicity of ultrafine TiO₂ particles in cultured human lymphoblastoid cells. *Mutat Res*. 628: 99-106.
- [6] Thevenot P, Cho J, Wavhal D, Timmons RB, Tang L. [2008] Surface chemistry influences cancer killing effect of TiO₂ nanoparticles. *Nanomedicine J*. 23; 4(3):226-36.
- [7] Arshak K, Morris D, Arshak A, Korostynska O, Jafer E. [2006] Evaluating the Suitability of Thick-film TiO₂ Capacitors for use in a Wireless Pressure Measurement System. *Materials Science and Engineering*. 26C:1077 -1081.
- [8] Agar FJ, Justicia I, Gerbasi R, Battiston GA, McSporran N, Figueras A. [2006] RBS Analysis of Substoichiometric TiO₂-anatase Thin Films for Visible Light Photocatalysis. *Nuclear Instruments and Methods in Physics Research*. 249B:490-492.
- [9] Lozano, Rey T, Rojas M, Moya S, et al. [2011] Cytotoxicity effects of metal oxide nanoparticles in human tumor cell lines. *Journal of Physics:ConferenceSeries*. 304: 12-46
- [10] Warheit DB, Webb TR, Reed KL, Frerichs S, Sayes CM. [2007] Pulmonary Toxicity Study in Rats with Three Forms of Ultrafine-TiO₂ Particles: Differential Responses Related to Surface Properties. *Toxicology*. 230:90-104.
- [11] Urban RM, Jacobs JJ, Tomlinson MJ, Gavrilovich J, Black J, Peoc'h M. [2000] Dissemination of Wear

- Particles to the Liver, Spleen, and Abdominal Lymph Nodes of Patients with Hip or Knee Replacement. *The Journal of Bone and Joint Surgery*. 82A (4):457-477.
- [12] Olmedo D, Guglielmotti MB, Cabrini RL. [2002] An Experimental Study of the Dissemination of Titanium and Zirconium in the Body. *Journal of Materials Science: Materials in Medicine*. 13:793-796.
 - [13] Topoglidis E, Discher BH, Moser CC, Dutton PL, Durrant JR. [2003] Functionalizing Nanocrystalline Metal Oxide Electrodes with Robust Synthetic Redox Proteins. *ChemBiochem*. 4:1332-1339.
 - [14] Tran TH, Nosaka AY, Nosaka Y. [2006] Adsorption and Photocatalytic Decomposition of Amino Acids in TiO₂ Photocatalytic Systems. *Journal of Physical Chemistry*, 110:25525-25531.
 - [15] Oberdorster E. [2004] Manufactured nanomaterials (fullerenes, C₆₀) induce oxidative stress in the brain of juvenile largemouth bass. *Environ Health Perspect*. 112(10): 1058-1062.
 - [16] Hsin YH, Chen CF, Huang S, Shih TS, Lai PS, Chueh PJ. [2008] The apoptotic effect of nanosilver is mediated by a ROS- and JNK-dependent mechanism involving the mitochondrial pathway in NIH3T3 cells. *Toxicol Lett*. 179(3): 130-9.
 - [17] Li N, Xia T, Nel AE. [2008] The role of oxidative stress in ambient particulate matter-induced lung diseases and its implications in the toxicity of engineered nanoparticles. *Free Radic Biol Med*. 44(9): 1689-1699.
 - [18] Sharma V, Shukla RK, Saxena N, Parmar D, Das M, Dhawan A. [2009]. DNA damaging potential of zinc oxide nanoparticles in human epidermal cells. *Toxicol Lett*. 185(3): 211-218.
 - [19] Gurr JR, Wang AS, Chen CH, Jan KY. [2005] Ultrafine titanium dioxide particles in the absence of photoactivation can induce oxidative damage to human bronchial epithelial cells. *Toxicology*. 213(1-2): 66-73.
 - [20] Kang JL, Moon C, Lee HS, Lee HW, Park EM, Kim HS. [2008] Comparison of the biological activity between ultrafine and fine titanium dioxide particles in RAW 264.7 cells associated with oxidative stress. *J Toxicol Environ Health A*. 71(8): 478-85.
 - [21] Kang SJ, Kim BM, Lee YJ, Chung HW. [2008] Titanium dioxide nanoparticles trigger p53-mediated damage response in peripheral blood lymphocytes. *Environ Mol Mutagen*. 49(5): 399-405.
 - [22] Singh N, Manshian B, Jenkins GJS, Griffiths SM, Williams PM, Maffei TGG. [2009] NanoGenotoxicology: The DNA damaging potential of engineered nanomaterials. *Biomaterials*. 30(23-24): 3891-914.
 - [23] Rezaei-Tavirani M, Dolat E, Hasanzadeh H, et al. [2013] TiO₂ Nanoparticle as a Sensitizer Drug in Radiotherapy: in Vitro Study. *Iran J Cancer Prev , Suppl*:37-44.
 - [24] Sayes CM, Wahi R, Kurian PA, Liu Y, West JL, Ausman KD. [2006] Correlating nanoscale titania structure with toxicity: a cytotoxicity and inflammatory response study with human dermal fibroblasts and human lung epithelial cells. *Toxicol Sci*. 92(1): 174-185.
 - [25] Lai JC, Lai MB, Jandhyam S, Dukhande VV, Bhushan A, Daniels CK. [2008] Exposure to titanium dioxide and other metallic oxide nanoparticles induces cytotoxicity on human neural cells and fibroblasts. *Int J Nanomedicine*. 3(4): 533-45.
 - [26] Lazou B, Jorly J, On D, Sellier E, Moisan F, Fleury-Feith J. [2008] In vitro effects of nanoparticles on renal cells. *Particle and Fibre Toxicology*. 19: 5-22.
 - [27] Peters K, Unger RE, Kirkpatrick CJ, Gatti AM, Monari E. [2004] Effects of nano-scaled particles on endothelial cell function in vitro: studies on viability, proliferation and inflammation. *J Mater Sci Mater Med*. 15(4): 321-5.
 - [28] Uchino T, Tokunaga H, Ando M, Utsumi H. [2002] Quantitative determination of OH radical generation and its cytotoxicity induced by TiO₂(2)-UVA treatment. *Toxicol In Vitro*. 16(5): 629-635.
 - [29] Yamaguchi S, Kobayashi H, Narita T, Kanehira K, Sonezaki S, Kubota Y. [2010] Novel photodynamic therapy using water-dispersed TiO₂-polyethylene glycol compound: evaluation of antitumor effect on glioma cells and spheroids in vitro. *Photochem Photobiol*. 86(4): 964-971.
 - [30] Matsui K, Karasaki M, Segawa M, Hwang SY, Tanaka T, Ogino C. [2010] Biofunctional TiO₂ nanoparticle-mediated photokilling of cancer cells using UV irradiation. *Med Chem Comm*. 1(3): 209-211.
 - [31] Kang SJ, Kim BM, Lee YJ, Hong SH, Chang HW. [2009] Titanium dioxide nanoparticles induce apoptosis through the JNK/p38-caspase-8-Bid pathway in phytohemagglutinin-stimulated human lymphocytes. *Biochem Biophys Res Commun*. 386: 682-687.
 - [32] Moller W, Hofer T, Ziesenis A, Karg E, Heyder J. [2002] Ultrafine particles cause cytoskeletal dysfunctions in macrophages. *Toxicol Appl Pharmacol*. 182: 197-207.

ARTICLE

PERFORMANCE EXPECTANCY (PE) AND ACCEPTANCE AND WILLINGNESS TO USE ELECTRONIC SERVICES: CITIZEN-ORIENTED ATTITUDE

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ABSTRACT

Living in today's world is a constant state of change. The advent of information and communication technologies and consequently, e-government, are the most important parts of these changes. If challenges and barriers to e-government development are identified, and appropriate strategies are adopted to fix them, implementing e-governance will bring numerous benefits to society. The statistical population of this study consists of water subscribers in Guilan Province that according to the Department of Water and Wastewater Inquiry which covers 99.86 percent of the urban population, and 652500 households, 458100 meters have been recorded. SPSS and AMOS software were used for data analysis. The results showed positive impact of performance expectancy on the acceptance and willingness to use e-government services.

INTRODUCTION

Different studies show that approximately all countries around the world are very optimistic in acquiring maximum benefits and advantages of information and communication technology through consensus in the core of public services systems and increasing the efficiency and effectiveness of public services via e-government [1, 2, 3]. The ultimate goal of different governments in implementing e-government is to provide people with the best services for developing competitive services in association with private sectors services and good governance in relation to the participation of citizens. Implementation of e-government has many issues to be solved to face the demands of twenty-first century from the governments, government agencies, politicians and the market economy. Among the various key issues discussed in e-government, the hottest topics include: open and free competition between public and private services systems, promoting public-private sector partnership and cooperation which is created by post-modernism displays a more effective, efficient and high-quality public sector, increasing citizen participation in government's decision-making by considering them as customers and the spread of democracy and finally, collecting the benefits of ICT for better market economy and globalization [4,5]. Although many articles focus on e-government acceptance from provider's view, relatively few know about why and under what conditions the public will accept e-government services (6). So the focus of this research is on accepting government services by citizens (the applicants). Despite few studies examining the acceptance of electronic services by citizens [7, 8], the important point is that, the development of society knowledge requires an informed citizen and a positive attitude, real use of new technologies such as e-government [9].

With the need of e-government for transparency, better accountability and government services, the citizens' problem in accepting the low level of e-government services in developing countries was diagnosed. This problem requires cultural, political, technological and social perspectives. Attitude and desire of citizens to use e-government services are key determinants of their interest in the adoption and use of e-government services. Acceptance of e-government services by citizens is a key issue for e-government initial success [10]. In addition, e-government services can not improve government service delivery if not used by the public [11].

On the one hand, understanding the advantages and benefits of using electronic services by customers is very important. Performance expectancy (PE) refers to the belief that the use of electronic services and the Internet will help users and customers to obtain benefits such as efficiency, productivity, and saving time as a result of the availability and customization of information [12,13]. In previous research in 2015, Al-Hujran et al by using a study with several study areas and in a large scale with 413 Jordanian citizens showed that attitude and desire of citizens to use e-government services are key determinants of their interest in the adoption and use of e-government services. Citizens attitude is determined in turn by the public perceived value and ease of use. These results in terms of management imply that the government needs to pay more attention to citizens attitude and desire to use e-government services [14]. In this regard, water and wastewater companies have ongoing and close interaction with people, because they offer services that are associated with people's daily life. Therefore, the water and sewerage companies in different provinces are going to equip and update their electronic services.

According to the mentioned literature, the main question of this research is that how much is the impact of performance expectancy on acceptance and willingness to use e-governance in water and waste water company?

KEY WORDS

performance expectancy, e-government acceptance, water and waste water organization

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METHOD

Models and hypotheses

The research model developed by the researchers examines the relationship between performance expectancy and acceptance and willingness to use electronic government services.



Fig. 1: The research conceptual model

According to the model, the following hypothesis will be tested:

H1: Performance expectancy has a positive effect on the acceptance and willingness to use e-government services.

Sample size and data collection

This study, according to classifying research in terms of objective lies in the category of applied research. The statistical population of this research consists of water subscribers in Guilan Province that according to the Department of Water and Wastewater Inquiry which covers 99.86 percent of the urban population, and 652500 households, 458100 meters have been recorded. The sample size was taken using the number of 460 citizens by Cochran's formula. In this study, survey method by means of a questionnaire was used for data collection. For the willingness and acceptance of e-government services, standard questionnaire with 3 items [15] is used. In the case of performance expectancy variable, 6 items raised by [16] were used .

Findings

From 460 respondents, 58 percent (267 individuals) were male and 42% of the population (n = 193) were female.

Table 1: Frequency distribution of the studied sample in terms of gender

Gender	Frequency	Percentage
Male	267	58
Female	193	42
Total	460	100

From 460 respondents, 85 people(18.5%) were high school diploma or lower degree, 277 individuals (60.2%) held associate's degree and bachelor's degree, 86 (18.7 %) had MA and 12 (2.6%) were doctorate degree holders. In [Table 2] the frequency distribution of individuals is shown in terms of education level.

Table 2: Frequency distribution of individuals based on education

Degree	Frequency	Percentage
High school diploma or lower degree	85	18.5
Associate's degree & bachelor's degree	277	60.2
MA	86	18.7
PhD	12	2.6
Total	460	100

Amounts of service quality indices (efficiency, reliability, responsiveness, security), desire and acceptance of electronic services, performance expectancy and transformational management are listed in [Table 3].

Table 3: Values of descriptive indices for the study variables

	Number	Mean	Median	Mode	Standard deviation	Variance	skewness	kurtosis	Min amount	Max amount
Willingness & acceptance of electronic services	460	2.17	2	2	0.826	0.684	0.709	0.536	1	5
Performance expectancy	460	1.99	2	1	0.794	0.631	0.654	0.125	1	5

Before testing the hypotheses of this study, normality of variables should be ensured. In quantitative variables, to determine the normality of univariate distribution, it is necessary to investigate the skewness and kurtosis of these variables' size. If the skewness and kurtosis were in the range of +2 and -2, we assume it acceptable for our current purposes. Otherwise, it should be converted.

Table 4: K-S test results for the assumption of normal distribution

Variables	Sample Size	Skewness	Kurtosis
Willingness & acceptance of electronic services	460	0.709	0.536
Performance expectancy	460	0.654	0.125

According to the results shown in [Table 5] in connection with the model of willingness and acceptance of electronic services, resultant of fitting indices confirms the model at 1% margin of error. Regression coefficients of the model measuring the willingness and acceptance of electronic services show the effect of each of the variables or items in explaining the variance or the primary factor. [Table 6] also shows confirmatory factor analysis results for the willingness and acceptance of e-services.

[Table 5] The fitting indices of the model measuring the willingness and acceptance of the willingness and acceptance of e-services

Table 5: The fitting indices of the model measuring the willingness and acceptance of e-services

Indices	P	CMIN/DF	RMR	GFI	IFI	TLI	CFI	RMSEA
Willingness & acceptance	-	-	0.000	1.000	1.000	-	1.000	0.50
Acceptable Level	> 0.05	< 5	< 0.05	> 0.90	> 0.90	> 0.90	> 0.90	< 0.1
Result	-	-	Fit	Fit	Fit	-	Fit	Unfit

Table 6: Confirmatory factor analysis results for the willingness and acceptance of e-services

Variable	Question or structure	Critical amounts	Standard factor loadings	Level of significance	Result
Willingness & acceptance of electronic services	1	—	0.74	0.000	Verified
	2	10.98	0.84	0.000	Verified
	3	10.62	0.58	0.000	Verified

According to the results shown in [Table 7] in connection with performance expectancy model, outcome of fitting indices confirms the model at 1% margin of error. Regression coefficients of the model measuring performance expectancy show the effect of each of the variables or items in explaining the variance or the primary factor. [Table 8] also shows confirmatory factor analysis results for performance expectancy.

Table 7: The fitting indices of the model measuring performance expectancy

Indices	P	CMIN/DF	RMR	GFI	IFI	TLI	CFI	RMSEA
Performance expectancy	0.000	3.47	0.029	0.91	0.96	0.92	0.96	0.16
Acceptable level	>0.05	<5	<0.05	>0.90	>0.90	>0.90	>0.90	<0.1
Result	Fit	Fit	Fit	Fit	Fit	Fit	Fit	Unfit

Table 8: confirmatory factor analysis results for performance expectancy

Variable	Question Or Structure	Critical standard Amount	Level of factor Loading	Result significance
Performance expectancy	4	-	0.77	0.000
	5	20.186	0.87	0.000
	6	20.968	0.90	0.000
	7	17.114	0.76	0.000
	8	17.952	0.79	0.000

According to the results shown in [Table 9] associated with the aforementioned model, the resultant of fitting indices confirms the model at a confidence level of 99 percent. According to the [Table 10], P value between performance expectancy and acceptance and willingness to use e-services is equal to 0.00, which is slightly smaller than 0.05. So it can be concluded that the hypothesis is approved at the level of 99%. In other words, it can be said that with 99% confidence level, performance expectancy has a positive effect on the willingness to use e-government services.

Standardized regression coefficient as shown in [Fig. 10] between two variables, performance expectancy and acceptance and willingness to use electronic services, is 0.70. This value is larger than 0.6. So, performance expectancy variable has a strong and positive impact on the adoption and use of e-services.

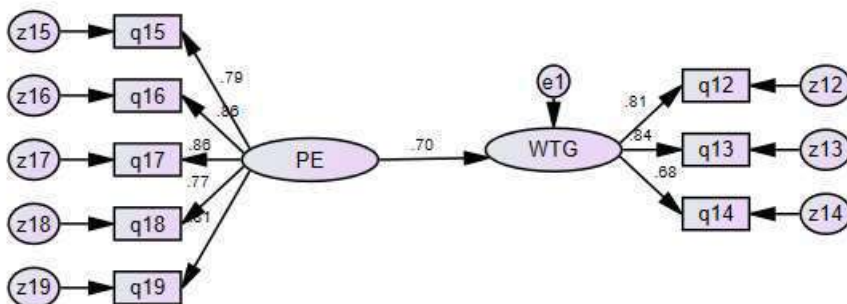


Fig. 2: Structural equation modelling of hypothesis H1

Table 9: Overall fitting indices of structural equation modelling analysis for hypothesis H1

Indices	P	CMIN/DF	RMR	GFI	IFI	TLI	CFI	RMSEA
Model	0.000	1.40	0.078	0.92	0.90	0.86	0.90	0.051
Acceptable level	> 0.05	< 5	< 0.05	>0.90	>0.90	>0.90	>0.90	< 0.1
Result	Unfit	Fit	Unfit	Fit	Fit	Unfit	Fit	Fit

Table 10: Regression co-efficients(results of testing hypothesis H1)

Hypothesis	Regression coefficients			Critical amount	P	Result	Effect
	Direct effect	Indirect effect	Total effect				
performance expectancy- willingness and acceptance of e-government services	0.70	–	0.70	–	0.000	Verified	Positive

CONCLUSION

Meanwhile, governments are spending a lot to deploy hardware and software to provide e-government services for citizens. Obviously, if these services are not accepted by the citizens, e-government projects will be faced with difficulty. Hence, the importance of research in water and wastewater organization of guilan province will be more evident, since this organization along with other government agencies for the welfare of citizens, saving their time and cost and preventing unnecessary visits to government agencies, has provided e-government project in the form of online bill payment and online registration for wwc services.

E-government has many benefits that is considered as a competitive advantage for the organizations which use it. The most important known advantages of e-governance after implementation in organizations include: more efficient public administration, provide better public services for citizens, better interaction with citizens and business sectors and industries, providing people with services at any time and in any place, more facilities and speed, greater transparency, greater accountability, integration of citizens and spreading self-reliance culture in providing services.

CONFLICT OF INTEREST

None

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None

REFERENCES

- [1] Sharif AM, Irani Z. [2010] The logistics of information management within an eGovernment context. *Journal of Enterprise Information Management*, 23(6): 694-723.
- [2] Jansen J, de Vries S, van Schaik, P. [2010] The contextual benchmarkmethod: benchmarkinge-government services, *Government Information Quarterly*, 27(3): 213-219.
- [3] Johnson M. [2012] A study of e-market adoption barriers in the local government sector. *Journal of Enterprise Information Management*, 25(6): 509-536.
- [4] Brown MM. [2007] Understanding e-government benefits". *American Review of Public Administration*, 37(2):178-197.
- [5] Reddick CG. [2009] The adoption of centralized customer service systems: a survey of local governments", *Government Information Quarterly*, 26(1): 219-226.
- [6] Gauld R, Goldfinch S, Horsburgh S. [2010] Do they want it? Do they use it? The 'Demand-Side' of e-Government in Australia and New Zealand. *Government Information Quarterly*, 27(2):177-186.
- [7] Alomari M, Woods P, Sandhu K. [2012] Predictors for e-government adoption in Jordan: Deployment of an empirical evaluation based on a citizen-centric approach. *Information Technology & People*, 25(2):207-234.
- [8] Alawneh A, Al-Refai H, Batiha K. [2013] Measuring user satisfaction from e- Government services: Lessons from Jordan. *Government Information Quarterly*, 30(3): 277-288.
- [9] Lytras, M & de Pablos, P O. [2011] Software technologies in knowledge society [Special issue]. *Journal of Universal Computer Science*, 17(9):1219-1221.
- [10] Liu Y, Li H, Kostakos V, Goncalves J, Hosio, S, Hu, F. [2014] An empirical investigation of mobile government adoption in rural China: A case study in Zhejiang province. *Government Information Quarterly*, 31(3):432-442.
- [11] Panagiotopoulos P, & Al-Debei, M M. [2010] Engaging with citizens online: Understanding the role of ePetitioning in local government democracy. *Internet, Politics, Policy*, 16-17.
- [12] Burke RR. [1997] Virtual shopping: breakthrough in marketing research, Harvard

- [13] Business Review, 74(2): 120-131.
- [13] Srinivansan SS, Anderson, R & Ponnnavolu, K. [2002] Consumer loyalty in e-commerce an exploration, if it is antecedents and consequence, Journal of Retailing, 78(1): 41-50.
- [14] Al-Hujran O, Al-Debei MM, Chatfield A, Migdadi M. [2015] The imperative of influencing citizen attitude toward e-government adoption and use. Computers in Human Behavior, 53:189-203
- [15] Sharma SK. [2015] Adoption of e-government services: The role of service quality dimensions and demographic variables. Transforming Government: People, Process and Policy, 9(2):207-222
- [16] Tan KS, Chong SC, Lin B. [2013] Intention to use internet Marketing, A comparative study between Malaysians and South Koreans", Kybernetes, 42(6): 888-905.

ARTICLE

THE ROLE OF COPING STYLES IN PREDICTING JOB BURNOUT IN MIDDLE AGED BY CONTROLLING THE GENDER VARIABLE

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ABSTRACT

Background and Objective: middle age is defined as a stage of psychological development in the context of life or the transitional period that includes biological, psychological and social changes. Middle-aged people can face with significant adjustment challenges in the workplace. In the discussion of psychological development in middle age, job burnout is a condition in which long-term job stress leads to emotional exhaustion, lack of personal fulfillment and a sense of achievement reduction. The aim of this study was to investigate the relationship between coping with stress styles and job burnout welfare organization staff. **Methods:** This study is a descriptive and correlational design. The sample in this study included all 40 to 60 year old employees of Tehran Welfare Organization who were working in the organization during the autumn 2014. For sampling, single-stage cluster sampling was used in such a way that among 17 centers of Tehran Welfare Organization, 5 centers were randomly selected and all personnel selected at these centers participated in the study. Also, to gather research data, Masles Job Burnout Inventory and Lazarus & Folkman Coping Styles were used. **Results:** The results showed that there is a direct significant correlation between coping style and emotion-focused stress [$P01/0\geq$] and there is an inverse significant relationship between coping style and problem-focused stress [$P01/0\geq$] and job burnout among Tehran Welfare Organization staff. Also, both styles of coping style and emotion-focused stress and problem-focused stress are able to predict job burnout. **Conclusion:** The results of this study consistent with previous research showed that stress coping styles have a significant influence in predicting staffs' job burnout.

INTRODUCTION

Middle age has been defined as a stage of psychological development throughout the life of the transitional period that involves the biological, psychological and social, etc. changes. This period occurs generally in the late 30 or early 40. Middle-aged people in the workplace can face with significant adjustment challenges [1]. In middle age, many workers begin experiencing age-related changes in sensory and physical health and performance and this issue puts their safety in the workplace designed for young at risk [2]. A concept that is talk about in the discussion of the problems of the middle period, especially middle age crisis, is job burnout; a concept that is used on the middle ages of employed ones, who are exposed to high levels of stress [1]. Job burnout was defined for the first time by Froudenburgh [1974] as a state of fatigue or frustration due to one's dedication to the job, lifestyle, purpose or relationships that have failed to obtain the expected reward [2]. Job burnout is a health-related problem in working life today. Masles and Jackson [1986] stated that job burnout includes three dimensions: emotional exhaustion, depersonalization and professional inefficacy [4]. They expressed emotional exhaustion as stress, feelings of being pressured and losing emotional resources of the person. Depersonalization is in fact a negative and pessimistic attitude towards others. Professional inefficacy also relates to loss of a sense of competence and the successful implementation of the work task or responsibility in relation to others and their negative attitude and evaluation [5]. Burke [2001], in discussing the psychological development in middle age, maintains that job burnout is a situation where long-term stress leads to emotional exhaustion, lack of personal fulfillment and a sense of reduced achievement. Job burnout is a work and stress-related syndrome [6 and 7] that can be described as a long-term response to chronic stress at work that influence employees across their profession and industry [7]. Job burnout is the result of continuous efforts to adapt to the stress of work or protect against it [6]. When the person in the workplace or living conditions faced this situation with that does not match with his current capacity and facilities, the person is affected with conflicts and internal challenges that is called stress [8]. The first effort to define stress in the behavioral or psychological fields was conducted by Volter Cannon. He defined stress as a syndrome of fight or flight [9]. This concept was more considered as understood by the works of Hans Selye on general adaptation syndrome. In 1950, Selye used the term stress. He defined general adaptation syndrome as the process of general efforts of body against stressful factors [10, 11]. Stress is a pattern of negative psychological and physiological states responses that occur in person [12]. Stress does not affect only the physical health but also affect the psychological well-being [11]. Stress also has a negative impact on the working performance and causes reduced permanently motivation and fatigue [12].

Lazarus et al. [1978] presented theory of stress and coping styles. According to their theory, individual adaptation and coping with stress involves two processes of cognitive assessment and stressful factors evaluation, and then try to deal with those factors [13]. Coping is defined as cognitive and behavioral efforts to manage specific internal or external demands that beyond the individual's resources, [6].

According to Mastert and Joubert [2005], coping can be described as one's efforts to stop, reduce or eliminate the negative experiences [14]. According to the theories proposed by Lazarus and colleagues, two

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initial coping responses were stated: emotion-focused coping and problem-focused coping [13]. The problem-focused coping style is focused mainly on the management or changing stressors, coping style on the other hand emphasized on expressing emotional responses to the problem [14].

Individuals act in different styles in a stressful situation. They can act as problem-focused or emotion-focused or sometimes they use both methods [7]. In fact, some people know how to deal with stress and challenging pressures and know how to avoid the detrimental effects of the stimuli [8]. Inadequate and ineffective coping skills can severely lead people toward job burnout [14]. Researchers found that the risk of experiencing job burnout can be adjusted through various coping strategies in an environment in which there is mental stress [7]. Several studies have shown that older people use less coping style of avoidance or escape from reality and use problem-focused coping style more [15]. The relationship between age, stress and the process of dealing with it is complex [2].

There are evidences of the relationship between coping style, stress and burnout [6]. The results of studies on stress management strategies have shown that when people are able to effectively deal with stress that face with the problem or use problem-focused strategies that requires their action [12]. For example, Hart and colleagues [1995] [7] found that problem-focused coping style leads to positive working experience, while emotion-oriented coping style leads to negative working experience. [7]. Also, Moscow and colleagues [12] in a study found that managers who use problem-focused coping styles of the managers who use emotion-focused coping styles experience significantly lower levels of stress and have fewer work absences. Results of a study showed that there is a relationship between strategies of dealing with stress and job burnout among teachers [3]. Over a study conducted in South Africa, researchers found that police officers who use emotion-focused coping style in the time of working stress experience emotional exhaustion and cynicism, while police officers who use of cognitive and active coping styles can modify their stress and job burnout [14]. White Hyde et al [2000] reported higher levels of job burnout in the middle age. But other researchers in their study found no significant difference between job burnout and age [16]. Another study results also showed that people who are older use more problem-oriented coping style [13].

Another study on the relationship between perfectionism and coping with stress strategies and job burnout showed that there is a significant negative correlation between the problem-oriented coping style and job burnout [17]. In another study entitled investigating the stressful factors in coping strategies and their relationship with job burnout, it was found that there is a positive significant relationship between stressful factors and job burnout [18, 19].

Given that few studies has been done on the relationship between coping with stress styles and burnout in middle age in Iran and given that the results in this area is somewhat ambiguous, the present study aimed to explore this relationship and seeks to answer this question whether there is a relationship between coping with stress styles and job burnout in the middle age.

MATERIALS AND METHODS

The present study is descriptive and is considered in the field of applied research. The current research design is a correlation design. The statistical population in this research includes all employees aged 40-60 years working in Tehran Welfare Organization who were working in Tehran Welfare centers during the fall 2014. According to the staffs' statistics in this organization in Tehran, a total of nearly 500 people were selected. According to Morgan table that specifies the minimum sample size as 217 people, the sample size in this study was 231. For sampling, single-stage cluster sampling was used so that among the 17 centers of Tehran Welfare Organization, 5 Center were randomly selected and all the personnel of these centers selected were participated in the study. Finally, the data were analyzed using Pearson's correlation coefficients and simultaneous multivariate regression.

Research tools

Two questionnaires namely Maslach Burnout Inventory and Lazarus and Folkman's Coping with Stress Strategies Inventory were used.

Maslach burnout inventory (MBI)

It is most common tool for measuring job burnout. This questionnaire has been known as a means of assessing the gold standard for measuring job burnout and includes three independent measures of 22 separate articles about the feelings and attitudes that assess different aspects of job burnout syndrome. 9 articles addresses emotional analysis, 5 articles to depersonalization and 8 articles to the lack of personal achievement. The frequency of these feelings is measured with scores of zero [never] to six [every day]. Internal consistency in all three dimensions of Job Burnout Inventory in the original sample [11,000 people] with Cronbach's alpha between 0.71 to 0.9 is in an acceptable level. Retest coefficients in short periods up to one month is 0.6 to 0.8. In two studies, test-retest reliability over a period of one year is investigated. Reliability coefficients in a sample with 700 tutors was 0.33 to 0.67 and in another sample includes 46

employed people in human services between 0.34 to 0.62 , respectively. In Iran, the reliability and validity of these instruments is considered. Cronbach's alpha coefficient of the test on hospital staff in Isfahan for emotional analysis was 0.88, 0.76 for personal accomplishment, 0.79 for depersonalization and 0.83 for the whole test [8].

Coping strategies questionnaire: it is a 66-article test that is based on coping strategies checklist [20] applied by Lazarus and Folkman [1985] in a wide range of thoughts and actions that people use when faced with internal or external stressful situations. At the beginning the subjects are asked to explain stressful situations that they recently experienced orally or written and then determine to what extent they use the following strategies in the regarded situation by reading questionnaire expressions. In some cases, the researcher specifies a position, such as medical treatment or a scientific test to determine a stressful situation. The test has eight sub-scales: a direct confrontation, distancing, self-control, seeking social support, accepting responsibility, evasion- avoidance, planned problem solving and positive reappraisal. In this questionnaire without time constraints for being implemented, the subjects are asked to both visualize the experienced position where they used confrontation strategies and respond the questions based on four-scale options. The test is normalized on a sample of 750 middle-aged couple. Cronbach's alpha coefficients of subscales is reported as follows: direct confrontation subscale: 0.70, distancing subscale: 0.61, self-control subscale: 0.70, seeking social support: 0.76, taking of responsibility subscale: 0.66, evasion-avoidance subscale: 0.72, planned problem-solving subscale: 0.67, positive re-appraisal subscale: 0.79 that the amounts indicated good reliability of this test. In a study on 763 male and female students in grades two and three of public high schools in Tehran, the reliability of coping styles questionnaire were estimated using internal consistency [Cronbach's alpha] as 0.80. In this study, to evaluate the convergent validity of coping strategies questionnaire, calculating the raw scores correlation resulted from this questionnaire with raw scores of Lionel Stress Questionnaire was used. The results showed that WOCQ test has high convergent validity. Also, the results of principal component analysis and Varimax rotation showed that the scale of coping styles is made up of 10 factors with factor loading more than 0.3 [8].

Findings

To investigate research results, Pearson correlation coefficient was first calculated between the scores of each coping with stress styles and dimensions of job burnout among Welfare Organization Staff of Tehran. Then, to determine the contribution of each coping styles in predicting job burnout of welfare organization staff in Tehran province, simultaneous multiple regression was used.

Table 1: Descriptive indices of research variables

Elongation factor	Skewness factor	Maximum	Minimum	Standard deviation	Mean	Scale
0.28	0.14	60	18	7.58	40.20	Emotion-focused coping
-0.20	-0.25	57	20	8.23	38.80	Problem-focused coping
0.02	0.37	36	1	7.42	15.47	Emotional analysis
-0.08	-0.11	22	0	4.61	10.10	Depersonalization
-0.18	0.23	29	0	5.91	12.65	Lack of interpersonal relationship
0.55-	0.18	78	8	14.59	38.23	Job burnout

The results in [Table 2] indicate that there is a significant correlation between emotional analysis scores [$r = 0/426$], depersonalization [$r = 0/241$] and interpersonal relationship [$r = 0/202$] with emotion-focused coping style [$P \leq 0.01$]. The results also showed that there is an inverse correlation between emotional analysis [$r = -0 / 457$], depersonalization [$r = -0 / 296$] and interpersonal relationship [$r = -0 / 308$] with problem-oriented coping style [$P \leq 0.01$]. In other words, increasing the scores of emotion-focused coping style and reducing problem-focused coping style increase scores of job burnout and vice versa.

Table 2: Correlation Matrix of coping styles and aspects of job burnout

Job burnout	Interpersonal relationship	Depersonalization	Emotional analysis	Problem-focused	Emotion-focused	
					1	Emotion-focused
				1	-0.337**	Problem-focused
			1	-0.457**	0.426**	Emotional analysis

		1	0.563**	-0.296**	0.241**	Depersonalization
	1	0.469**	0.427**	-0.308**	0.202**	Interpersonal relationship
1	0.771**	0.792**	0.860**	-0.451**	0.375**	Job burnout

Also, to determine the contribution of each styles of coping stress in predicting job burnout of Tehran Welfare staff, multiple regression analysis was used. Therefore, given the assumptions of linearity, normality, constant variance and linearity, multiple regression analysis was performed. The results of simultaneous multiple regression analysis method is presented in [Table 3].

Table 3: Summary of multiple regression analysis of job burnout prediction of Tehran Welfare staff through coping styles

Variable	F	R	R ²	B	β	P
Constant	39.875	0.509	0.259	43.962	-	0.001
Emotion-focused coping				0.484	0.251	0.001
Problem-focused coping				0.649-	0.366-	0.001

[Table 3] summarizes the multiple regression analysis of job burnout in Tehran Welfare staff through stress coping styles. Assuming that R² is the common variance percentage of emotion-focused coping styles and problem-focused coping styles in predicting staffs' job burnout of Tehran Welfare Organization, the results of above table shows that all variables used [emotion and problem-focused coping styles] predicts 26% of the variance in job burnout among Tehran Welfare Organization staff. Given the calculated F is significant at the level of less than 0.01, thus linear regression model is significant. Regression analysis results showed that emotion and problem-focused coping styles [$P \leq 0.01$] can significantly predict staffs' job burnout among Tehran Welfare Organization staff. In other words, with increasing the scores of emotion-focused and problem-focused coping styles with stress, job burnout increases among Tehran Welfare Organization staff and vice versa.

DISCUSSION AND CONCLUSION

In the present study, the relationship between coping styles with stress and job burnout in middle age was examined. The results showed there is a direct significant correlation between job burnout among Tehran Welfare Organization staff and emotion-focused coping style [$P \leq 0.01$] and there is a significant inverse relationship between problem-focused coping style and job burnout among Tehran Welfare Organization staff [$P \leq 0.01$]. Also, two problem-focused coping style and emotion-focused coping style can predict job burnout. Hence, problem-focused coping style has the highest correlation and the power to explain job burnout among research variables. Burnout is a psychological as well as physical fatigue syndrome, which can lead to negative behavior and attitude towards their work and cause unproductive work and absenteeism, low morale and lack of job satisfaction [5]. Job burnout is a serious developmental threat in middle age that is associated with poor health analysis [21]. Long and persistent workplace stress can cause problems such as job burnout and follow problems such as resignation, repeated absenteeism, reduced work efficiency and reduced energy [22]. Stress is a negative issue for everyone, research insist that mistakes, failures and obstacles are potentially an opportunity for learning and the resources to deal with future adverse events [13]. What is more important in the processes of stress-related diseases than stress and its intensity itself is the type of reaction and response to stressful factors [23]. Meeting the demands management process [external or internal] refers to what has been assessed difficult or beyond the resources of individual [20]. It is clear that age-related changes in health and social roles influences the experience of stressful factors and this in turn affects the individual coping with stress [15]. Two types of general coping strategies are problem-focused coping and emotion-focused coping. Problem-focused coping intends to eliminate problem or adjust it, while emotion-focused coping seeks to restrain emotional consequences of stressful factors [20]. People use different coping responses in the face of stressful situations. Using a variety of effective and ineffective coping strategies will follow different consequences for physical and mental health of individuals. The results of some studies have shown that inefficient coping in the face of stress leads to increased tension and challenge [23].

According to results of this study, it was found that emotion-focused coping style is positively related to job burnout and the middle ages who use emotion-focused coping have higher job burnout that this finding is consistent with previous findings [24, 25]. In previous studies, researchers concluded from their studies that inadequate coping strategies are very important factors of job burnout. In another study, it was also concluded that the way to deal with stress is effective in job burnout [19].

The results also showed that there is a negative inverse relationship between problem-focused coping styles and job burnout and the middle ages who used more problem-focused style have less job burnout.

The findings of this study are consistent with previous research that showed there is a negative relationship between problem-focused coping styles and job burnout [7]. The results of this study are generally consistent with the results of many previous studies [3, 12, 14, 26]. But the findings of this study are not consistent with the results of other research which stated in their study that there is no relationship between coping styles and job burnout.

According to what has been mentioned, it can be concluded that there is a relationship between coping with stress styles and job burnout among middle age and the ones who use emotion-focused coping style show higher job burnout and the middle age who use problem-focused coping style show less job burnout. The results of this study are consistent with many research mentioned in this field.

Based on the present results, it is recommended that training courses in the field of coping with stress and explaining in job burnout and its symptoms be held for middle-aged to provide knowledge to the people in this regard, and also helped middle-aged people to better face with working stress and use more problem-focused strategies and styles.

CONFLICT OF INTEREST

There is no conflict of interest.

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FINANCIAL DISCLOSURE

None

REFERENCES

- [1] Aliakbar DM, Ahmadi AA, Hosseinaie A. [2012] Middle-aged job burnout: a potentially transformational event. *Developmental psychology, psychology of Iran*. 31:279-289.
- [2] Hansson RO, Robson SM, Limas M. [2001] Stress and coping among older workers. 17: 247-256.
- [3] Bagoeci B, Hamamci Z. [2012] An Investigation into the Relationship between Burnout and Coping Strategies among Teachers in Turkey. *International Journal of Humanities and Social Science*. 2(12) : 67-72.
- [4] Helkavaara M, Saastamoinen P, Lahelma E. [2011] psychosocial work environment and emotional exhaustion among middle-aged employees. *BMC Research Notes*, 4 (101): 1-8.
- [5] Shini JP, Baraz Padaranjani Sh, Beiranvand S. [2014] The relationship between self-esteem and job burnout among nurses. *Journal of Clinical Nursing*. 2(3): 52-62.
- [6] Montero-Marin J, Prado-Abril J, Piva Demarzo MM, Gascon S, Garcia-Campayo J. [2014] Coping with Stress and Types of Burnout: Explanatory Power of Different Coping Strategies. *PLoS One*, 9(2):89-90.
- [7] Backteman-Erlanson S. [2013] Burnout, work, stress of conscience and coping among female and male patrolling police officers. Medical dissertation. Umea University, Department of Nursing, New Series. 1578.
- [8] Hojatinia F, Pourshafei H, Dastjerdi R. [2013] A comparative study of the relationship between lifestyle and coping with stress and job burnout among teachers of special and regular education at Birjand. 6(119): 6-20.
- [9] Romas J, Sharma R. [2004] Practical stress management. USA: Pears on Education Inc.
- [10] Javidi N. [2013] The Effectiveness of Emotion-Focused Couples Therapy [EFCT] In Improving Marital Satisfaction and Family Behavior Control. Fall-Winter. 3(2):65-78.
- [11] Nayak J. [2008] Factor Influencing Stress and Coping strategies Among the Degree College Teachers of Dharwad City, Karnataka. Home Science in Family Resource Management Master Dissertation, University of Agricultural Science, Department of Family Resource Management.
- [12] Mesko M, Erenda I, Videmsek M, Karpljuk D, Stihec J, Roblek V. [2013] Relationship between stress coping strategies and absenteeism among Middle level - Managers. *Management*. 18 (1): 45-57.
- [13] Monteiro NM, Balogun ShK, Oratile KN. [2014] Managing stress: the influence of gender, age and emotion regulation on coping among university students in Botswana. *International Journal of Adolescence and Youth*. 19(2): 153-173.
- [14] Myendeki AN. [2008] Job Stress, Burnout and Coping Strategies Of South African Police Officers. Social Science Master Dissertation, University of Fort Hare, Department of Psychology.
- [15] Aldwin CM, Sutton KJ, Chiara G, Spiro A. [1996] Age Differences in Stress, Coping, and Appraisal: Findings from the Normative Aging Study. *Journal of Gerontology: Psychological Science*. 5(4): 179-188.
- [16] Bayani AA, Bagheri H, Bayani A. [2013] Influence of Gender, Age, and Years of teaching experience on Burnout. *Annals of Biological Research*. 4 (4):239-243.
- [17] Jafari A, Pakdaman Sh, Fathabadi G, Vaez Mousavi M. [2012] The relationship between perfectionism and coping with stress and job burnout in soccer athletes. *Motor Behavior*. 11: 147-162.
- [18] Rezazadeh A. [2008] studying the stressful factors and coping strategies and its relationship with job burnout among primary school teachers in Birjand city. Master's thesis on Exceptional Children. Azad University of Birjand.
- [19] Maddahi ME, Javidi N, Samadzadeh m, Amini M. [2012] The Study of Relationship between Parenting Styles and Personality Dimensions in Sample of College Students. *Indian J Sci Technology*. 5(9):3332-3336.
- [20] Lazarus RS, Folkman S. [1984] Stress, appraisal, and coping. New York: Springer.
- [21] Javidi N, Soleimani A, Ahmadi Kh. [2013] Efficacy of emotionally-focused couples therapy [EFCT] to improve family functioning. *J Behav Sci*. 7(2):181-188

- [22] Berk LE. [2001] Developmental through the lifespan. New York: Macmillan.
- [23] Mehrbizadeh HM, Atash Afrouz A, Shahni yeylagh M, Rezaie Sh. [2013] Comparison of public health, occupational stress and job burnout among teachers of special and regular schools. Journal of Shahed University, twentieth year, new period. 9: 53-64.
- [24] Heydari PA, Gharakhani M, Mahjoub H. [2010] Comparison of stress experienced and coping strategies in patients with coronary artery disease and heart Wenner of healthy people. Journal of Hamadan University of Medical Sciences and Health Services. 17(3):33-38.
- [25] Meehan HL, Bull SJ, Wood DM, James DVB. [2004] The overtraining syndrome: a multi contextual assessment. The sport psychologist. 18: 154-171.
- [26] Najafi M, Soleimani AA, Ahmadi K, Javidi N, Kamkar EH. [2015] The Effectiveness of Emotionally Focused Therapy on Enhancing Marital Adjustment and Quality of Life among Infertile Couples with Marital Conflicts. *International Journal of Fertility & Sterility*. 9(2): 238-246. Dallaire J [2006] Develop your mental skills by training to improve personal performance. Performance prime, McGraw-Hill

ARTICLE

STUDY OF CAUSALITY IN THE LOSS OF OPPORTUNITIES, IN HEALTHCARE TREATMENT

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ABSTRACT

Background: The problem of the loss of time in cure treatment is a subject that has been considered especially recently. This paper, tries to study causality and method of compensation in civil liability arising from the loss of opportunity for the medical staff's treatment according to the importance of time and opportunity for patients with certain conditions or in case of emergency treatment. **Methods:** causality in the law, is one of the causes of liability that is involved compensation in the civil rights and punishment in criminal law. In fact, the issue of causation is considered because it is the cause of the fault and the damage associated with the loss of opportunity to be treated by medical staff; because, sometimes, despite the loss of time and opportunity to cure, may cause damage or injury to the patient not due to this and other reasons have been logged. **Results:** Finally, with regard to the issues raised in this research was seen that waste of time and loss of opportunity for treatment, is one of the losses by the medical staff, can be realized to the patient and this type of loss, could be as independent and definitive loss, which is evidence of loss of profit that should be compensated by using general rules of civil liability.

INTRODUCTION

Medicine and law always been two privileged sciences in human societies and the two have been of importance beyond in modern times so to imagine a society without them, if not impossible, much impossible. Along with new developments in medicine, the development of law and the revision of laws and regulations is inevitable and laws to keep pace with the evolution of new biomedical techniques, are considered as an integral part of society and its attitude to the social order. In Mo'in Persian dictionary responsibility is defined as: "Responsibility means being obliged to do something." So, who is responsible for another's liability, if he/she does not do it, than he/she wanted to do. Civil liability as enforcement of civil rights, plays a vital role in demanding and obtaining rights of individuals, and thus setting of legal and social relations. There is no objective real sense of right without civil liability, and only takes mental aspects. In the meantime, what really brings right from potential to actual and puts it in the hands of the rightful owners tangibly is rules and regulations in the legal system of the countries, including Iran which is included in the framework of different laws. Understanding patients' rights and requirements to deal with patients and given the importance of timely and accurate care to patients, especially patients with certain conditions such as emergency condition is an issue that more and more people have become aware of it recently. According to the complaints against victims of medical errors in hospitals and medical staff to treat and the loss of opportunities for people and even death in some patients reflects the needs of the legal community, to clarify such issues. This paper attempts to study causality and method of compensation in a civil liability arising from the loss of opportunity for medical staff to treat. Causality in the law, is one of the causes of liability that it has been set for it compensation in civil law and penalties in criminal law. In fact, the issue of causation, it is proposed that the cause of the damage, and fault should be related with the loss of opportunity for treatment by medical staff, because, sometimes, despite the loss of time and opportunity to cure, may cause damage or injury to the patient not due to this issue, and there are other reasons.

KEY WORDS

Loss of opportunity, civil liability, compensation, treatment staff, treatment

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RESEARCH'S LITRATURE

Medical malpractice and patients' rights

Patients' rights, is one distinctive thing in standard definition, to impose the rule of clinical services. The patient rights charter, was designed for the first for in Iran time in 2002. Due to the necessity of developing a comprehensive text on the rights of patients, Patient Bill of Rights in Iran, was developed with a view to defining a new and comprehensive health care recipients' rights and the ethical treatment [1]. Based on patient rights, patient has the right to expect appropriate care and treatment as soon as possible, effectively and with full respect regardless of ethnic, cultural and religious factors of the treatment group. What is emphasized here, is the right of treatment as soon as possible and the prevention of loss of opportunity.

There are different opinions, about the definition of malpractice and medical errors. Medical errors are expressed as follows in a denition: Service failures or mistakes in planning and implementing acts that are actual or potential and cause an unintended consequence. Medical malpractice, is a negligence and error that done on mistake and the fault is said to be a deliberate error. Medical malpractice is divided into 4 categories:

- A) Being oblivious
- B) Negligence
- C) lack of skills (which is itself divided into two categories lack of scientific skill and lack of practical skills) and

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D) Failure to comply with government regulations

Causality

Causality in the law, is one of the causes of liability that it has been set for it compensation in civil law and penalties in criminal law. Because causality discussed separately, both in civil law and criminal law, a suspicion has been created that causality in civil law is distinct from causality in criminal law but by studying the principles and provisions of causality, it is quite clear that the nature of them is the same and should not be considered the difference between the two [2].

Causality, is any means that that make human being reach his/her goal [3] and according the principles of jurisprudence, it is the thing that if it does not hit an obstacle to the existence of something, cause existence of it, for example the fire is burning [3]. Causality is used against the steward to be handled, and stewardship means that crime is made directly by the person himself, in other words he/she is not a mediator between action and damage. On the other hand in contrast, in causality person provides the foundation for efficiency of cause and damage but not to directly committed the crime [2]. However, it should be noted causality does not occur unintentionally and sometimes causer, intentionally causing buildup. Like someone who does not have the ability to deal with other, he dug a well on track and cover it in order to the person fall in and die, Or deliberately into a deadly poison contaminating other food to eat it and die. Or deliberately into a deadly poison contaminating other food to eat it and die. Therefore, this statement can not be admitted that for granted that in causality, the origin of the action is not directed to the detriment of the agent by itself, but due to his fault or negligence and neglect, harm others, as if not tightly chained dogs and dogs being abandoned to attack a passers-by [4]. However, causality, both in civil and criminal matters, can be defined as harmful act or criminal offense indirectly [2].

For liability of waste of causality mentioned conditions in some legal sources, including the causer action should be outside the scope of his/her property, not eligible legal issues and rational deemed and according to custom, seen forcible [5]. The meaning of aggression, something that is not legally permitted to do by causer such as digging wells on the property of another, or lay a stone in a public road, that if lead to waste, necessitate liability. But dig a well on another property with his permission, or in public places despite the general goodness, if lead to the waste, does not guarantee. Also, in many of the provisions of causality, proof of liability, subject to wastage (causing negligence in performing his duties), so that is allegedly related to him/her. Like fire in his/her property likely to spread to adjacent property, a short wall repair damaged homes and neglect in the keeping of animals. So, in the causality, unlike involvement, omission could also lead to a liability. In accordance with Article 331 of the Civil Code of Iran "Whoever causes monetary loss, he/she should be like or give it back, and if the defect or flaw it should handle its deficit deal price".

The important point in the discussion of causality, it is that being responsible for causer, subject to conditions that include the cause is guilty. For example, Article 334 of the Civil Code of Iran says: "The owner or possessor of the animal is not responsible for damage done by animals unless the fault is in keeping animals ...". Similarly, Article 335 of the Civil Code of Iran relating to the collision of the two vehicles, says a party is responsible who committed the fault and error and if both sides are at fault in an accident, the responsibility will be the responsibility of both.

Article 333 of the Civil Code also states in this regard: "The owner is responsible for damages of wall or building or factory enters its deterioration, provided that the damage is the result of a wrong result, the owner Get over it, or the lack of care he is sure" and promiscuity that is mentioned in the last article, ie a fault and failure to inform the property in his care of his property to prevent damage means the fault.

Article 516 is also about the obligations of transport operators, states if the goods which they have been entrusted, lost, will not be responsible, because they are trustees unless it is proven negligence and abuse. The responsibility for transport operators is also subject to obtaining their fault.

Article 666 of the Civil Code says: "If the lawyer's fault, damage to client notice that the Gnostics considered causative agent, will be responsible for. So, the responsibility of a lawyer who has caused damage to a client, is also subject to proving his fault.

Finally, Article 7 of the law of civil liability related to damage caused by a minor or insane, that if the fault cause can not be proved, he would not be the responsible of damage.

The second condition is the responsibility of the causer, in causing harm or loss of the opportunity [6], as Article 331 of the Civil Code of Iran, knows responsibility, subject to loss or damage to property.

The third condition of proving the causer responsibility, is that if in addition to the causer, there is a steward, the causer should be the stronger. Article 332 of the Civil Code states: "If one could create financial losses and other loss of the property becomes steward, the steward is responsible, not the cause unless the cause is stronger...". To take steward's responsibility, and impose to the cause, steward would be stronger than cause.

The fourth condition is that, damaged in damages against him is not parabola, in this case, the responsibility is not on the doer. Because it is possible to consider the responsibility of another related to his/her action against him/her. Fault element plays an effective role in strengthening or weakening the cause of responsibility, for example, a child committed a harmful act, and an adult is effective in it in the meantime, and forced the child to commit the act, responsibility of the responsible perpetrator is removed and placed the responsibility of the motivator person [7].

Loss of opportunity of treatment and causation

Sometimes a person is in a position to enable a profit in the future or has the opportunity to prevent the occurrence of damage or at least to prevent it from spreading. For example, for the treatment of patients still opportunity and take the necessary steps, but if this opportunity is lost due to the negligence of medical staff the loss of opportunity can be raised. Such that: a sick person refers to a physician, but the doctor due to negligence or wrong, does not recognize the correct or timely disease or type of it, however, later that diagnosis was wrong and if not medical malpractice, etc., should be correctly diagnosed the disease or type of it and there was the possibility of disease, whereas now the possibility has been ruled out [8]. In these cases, what is considered losses and its debatable potential compensation is the missed opportunity itself not the final loss such as the death or disability of the patient and the ultimate benefit of the patient that there be the possibility of it but, in fact, has been lost by the fault or error of doctor. Thus, the lost opportunity, should not be confused with the expected benefit and it is considered one of the ultimate losses caused by the loss of opportunity, [9]. It can not definitely say that if the patient was treated, she/he was treated and was improved but there it is only likely [10]; but it is certain that such an opportunity is missed because of the fault of the owners of the medical professions. In the case that someone will suffer losses caused by others, apparently no doubt in fulfillment of its definitive loss; since the loss, actually performed. This is common in medical errors. For example, as a result of physician negligence, ill treatment opportunities are lost and the patient dies or becomes disabled; however, it can be proved that if the doctor did not make a mistake and the patient was treated almost certainly with effective treatments and, ultimately, death or disability does not take place. Therefore in such cases, due to the existence of doubt in causality the liability of defendant is doubtful and we can say that to solve this problem (proof of causal relationship), especially in the medical rights issues, have raised the theory of loss of chance [8].

What is common in the various definitions of causality is that the operation can be attributed as cause, which at least it is necessary for the realization of losses. According to this concept of causality, in the case that a person loses the opportunity to avoid the loss, can not clear the causal relationship to be established between medical staff faults and losses. Because it was not proven that if a doctor guilty of negligence (lack of cause), the patient did not die or be disabled (no reason), it seems almost impossible.

Some lawyers to solve this problem have tried to offer a new concept of causal relationship that is a combination of causality and probability and the details of it are beyond the scope of this article [11].

Types of losses in the treatment opportunity loss

A- bodily injury

The human being whose life was in danger and not be able to fix it, refers to the medical staff and the trust that they can fix it. The medical staff can take timely action and use their expertise to prevent the realization of the damage to him/her in this situation. However, they may refuse any intervention or help and deal with this issue recklessly. So, in this case, the first damage that is likely to enter into victims, is damage to his physical integrity and the possibility of severe bodily injury and death is very high. That's why it was said, to the special character of our assumption, the most common damage, is this type of injuries.

In the event of these kind of injuries, their assessment facing the challenge for two major reasons. First most of the damages came from the injuries, realized in the future and the possibility of speculation in them is very high. For example, it is difficult to be convinced that what will be the complications of a broken bone or brain trauma or how much it costs to take their treatment or how much is the amount of damages caused by their disability [12]. Thus, the detection of the exact amount of compensation that can eliminate all traces of such injuries, is not possible. Moreover, how can the amount of money no matter how much to pay, claiming that damages caused by death, was compensated to the victim or essentially can the death of a human being be evaluated by money? Jr. [13]. Second due to the dual face of this type of injury and its relation to moral damages, the difficulty of assessing this type of damage, it also spreads to them. However, since the amount of compensation paid to the injured and compensation for losses sustained minor though it is better than having no compensation, a way to evaluate this type of losses, is the amount fixed by law for any injury as a floor of damage which must be paid by the agent of harm, to the victim or his heirs. Wergild in our legal system has this role. However, legal precedent, shows resistance but accepted that doctrine is accepted properly that wergild is a given compensation [12]. Along with the expected entry of injury to the victim, is more than other types of losses, the possibility of damage to his spiritual is imaginable.

B- Spiritual detriment

Spiritual detriment may be due to loss of possessions that a person is dependent on them or he is associated with intellectual property rights, such as his business reputation or come from the factors that directly affect the interests and physical integrity of a person's character. Among the most significant spiritual event that damages arise when the rights and obligations and moral aggression would be severely compromised.

Another important point is the spiritual damage, is that it is not limited to the injured or the victim of the accident. And may even, others because of their relationship with the aggrieved due to irreparable damage

to his body and spirit suffer from mental impression and pain. The most significant of these individuals, are the family and the victim's heirs [12]. Thus in our assumption, if the victim died or suffered of severe physical injuries, his relatives could also claim compensation for injuries their spiritual.

Responsibility for loss of opportunity for treatment

While discussing this subject independently does not pass a long time Iranian law and consequently no letter of the law and jurisprudence on this issue; but underlying this concept are shown in the Act. Article 565 of the Civil Code is presented on the basis of the remuneration is saying "Presented contract is permissible as long as the operation has not completed any of the parties may refer but if you refer forger During practice should give a reward. " Because the forger is terminated, the opportunity to achieve the desired goal is eliminated and the business value that is missing from this action is a measure of the ultimate loss.

Article 6 of the law of civil liability, to support the affected employees have the right to damages resulting from lost position themselves to take charge of the event, in fact, alimony recipients, have been deprived of the opportunity to benefit in the future. The potential benefits that may be due to other factors, this right was taken away from him/her. However, it is demandable by legislator There are two views in civil law on civil liability and the liability of the coercive: some say it's basis is the fault, and others say loss is liability issue. On this basis, responsibility and interests of human actions is very clear. But about medical errors and medical staff, which is considered as the most obvious example of a lost opportunity, a group of lawyers, with an emphasis on the fact that the lack of responsibility of strengthen opportunities in medical errors, will lead to an unfair result, according to "risk" knows a missed opportunity to be compensated [14], From among jurists who have discussed some of them don't consider loss of opportunity as loss of material, and say it is not dueable [15].

It is worth noting that this category of lawyers, at the same time, by verifying that no admission of liability due to loss of opportunity of treatment in medical errors, resulting an unjust consequences, using the theory of risk in this area of responsibility are considered better [14]. For some lawyers, it is not necessary separation between different alternatives of problem, and in each case the norm, considers "missed opportunity" valueable and that its loss is considered loss (whether material or spiritual), it should be compensated undoubtedly [16]. Finally, it is alleged that the most appropriate way to redress the effects of lost opportunity, is based on the theories of causes of civil responsibility [17]. However, one of compensable damage characteristics, is Certainty of it, in some countries law, loss of opportunity to achieve profits or avoid losses, regardless of the possibility of it have been considered another loss separately [14].

Authorities

For dealing with medical crimes and misconduct in Tehran, District 19 Special Prosecutor is working to handle this type of crime, is working that after inquiries from trusted experts in terms of Forensic Medical Council, a final judicial decision will be taken. Also, pursuant to Article 1 of the Law of Legal Medicine Organization Act of 1991, one of the jobs of the coroner as a public entity with independent legal personality is, commenting on the affairs of Forensic Medicine and Bachelor of autopsy and laboratory and clinical work done on the orders of the judicial authorities.

Iran Medical Council disciplinary regulations based on laws passed by parliament and approved by government deal with the violations of doctors and other members of the organization. According to the specialty in medical diagnosis and requires the use of experts and qualifiers, it seems that the authorities are the most appropriate and reliable references available which utilizes the science of medicine and the power of determining the causes and identify the causes of violations and errors and medical malpractice of medical staff are able to address these important affair. In fact, their expert opinion, if is issued unbiased and professional and objective justice is basic need for justice in this area.

CONCLUSION

The main subject of research is to study the causality in the loss of opportunities, in healthcare treatment. As noted above, one of the most important law issues of today, is civil liability clinical staff that civil law and civil liability law are silent about it. However, respect for the patient and the defense of human rights in times of illness and medical emergencies, without discrimination of age, sex and having financial power, known as patient rights. Unfortunately, despite the increase in medical accident, jurisprudence governing authorities and civil liability insurance, medical and paramedical could not be responsible for damages and given that the Iranian legal system, So far in the field of medical liability except for a few limited material in the IPC - which has been adapted from Islamic jurisprudence - has not adopted a specific law, medical civil liability claims are settled based on the traditional rules.

With consideration of the nature and basis of medical professional liability, we find that although jurists explicitly not raised the idea of losing the opportunity to improve or heal the sick, and they did not consider it, but the context of their statements on the concept of harm and common criteria for assessing the harm that has been predicted for necessary measure the clearly is apparent. With regard that currently, custom considers these valuable opportunities and the loss of it is considered a disadvantage, Therefore, from the

perspective of Islamic jurisprudence in such cases, medical jobs which strengthen the opportunity to improve their patients' health care, will have responsibilities in this respect. This theory can be applied broadly in medical law According to Islamic Countries Law, Common Law system, especially in the French legal system, and several verdict have been issued on the basis of it. So that one of the controversial issues of civil liability is about the relationship between causality and certainty of loss in these cases. Based on the discussions waste of time and loss of opportunity for treatment, is one of the disadvantages that the medical staff can enter patient and this is independent type of the loss and compensation should be according to general rules of civil liability.

CONFLICT OF INTEREST

There is no conflict of interest.

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None

REFERENCES

- [1] Parsapour A, Bagheri A, Ardeshtir Larijani, MB. [2009] Charter of patients' rights in Iran, Iranian Journal of Medical Ethics and History, Volume 3, Special Issue, Winter 1388, pp. 39- 47.
- [2] Poorbafrani,H, Delpak Yegane E, Tabatabaei SMS. [2014] unity or duality of being the cause in civil and criminal law, Journal of Private Law, 11(2). Fall and Winter
- [3] Langroodi Jafari MJ, [1996] legal terminology, Ganjedanesh Press, Tehran.
- [4] Langroodi Jafari MJ.[2007] legal terminology, Ganjedanesh Press, Printing 18, Tehran.
- [5] Mousavi Boroujerdi H,[1998] jurisprudential-rule Alfghyh, Qom, Iran.
- [6] Yazdani AR, [2000] scope of civil liability, First edition, Adabestan publishing, Tehran.
- [7] Ghasem Zadeh M. [2007] civil rights (without contract obligations and civil liability), first edition, published in, Tehran.
- [8] Tôth F. [1997] Responsabilité du médecin pour un diagnostic erroné :commentaire de l'affaire Massinon c. Ghys, (1996-97) 27 R.D.U.S, 319-318.
- [9] JOURDAIN, PATRICE .[1999] RESPONSABILITE CIVILE, OBLIGATION D'INFORMATION DU MEDECIN; EXTENSION DE L'OBLIGATION AUX RISQUES EXCEPTIONNELLES GRAVES, RTD CIV1. JANVIERMARS99.
- [10] Hussein, Abdalatif, civil responsibility for Alkhtae degrading, Tayeb, architect, contractor, attorney, First Edition, Beirut: the Aliyyataketab Company.
- [11] Boré Jaque . [1974] L'indemnisation pour les chances perdues, une forme d'appréciation de la causalité d'un fait dommageable. J. C. P.1-2620.
- [12] Catozyan N, [1990] Civil Law, compulsory liability (civil liability), Tehran, Tehran University Press.
- [13] Jr. (Valtrty Champyvn), sports rights, civil liability, translated by Hussein Aghaee Nia, [1995] Tehran, Islamic Republic of Iran's National Olympic Committee Press, p 313.
- [14] Catozyan N, [2003] obligations out of the contract: guarantee compulsory, vol. 3, Tehran, Tehran University Press.
- [15] Baryklu AR, [2008] civil liability, 2:72. Tehran, the Legal Foundation,
- [16] Kazemi M, [2001]"the theory of loss of chance in civic duty", Journal of Law and Political Science, No. 53, Fall.
- [17] Sham Abadi H.[2009] strengthen civil liability in the legal opportunity to IRNA, Tehran, Shahid Beheshti University, dissertation for a doctoral degree in Private Law, p 90.

ARTICLE

STUDY THE SENSORY EFFECTS OF TOXIC COMPOUNDS OF BENZIMIDAZOLES BY CONDUCTOMETRY

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ABSTRACT

Background: Sensors have different kind. The sensors based on electrical conductivity are considered as one of chemical sensors. Lack of selectivity is among deficiencies of these sensors. This feature has limited the application of these sensors in different industries. The proposed method in this research work is to increase the selectivity of sensor based on the electrical conductivity by molecular molding in order to produce polymer. In recent years, conductive polymers carried out applications in this field and in this case, polyaniline has potential capabilities. In the current research, the sensing effects of Benzimidazole compounds were studied with conductometry by using molecularly imprinting method. Increasing the selectivity of the respective sensor in accordance with conductometry and based on changes in the electrical conductivity of polymer before and after connecting to the desired toxin, by the use of molecular imprinting method for the preparation of polymers is the proposed method in this research work.

INTRODUCTION

KEY WORDS

Sensor, Conductometry,
Molecular Imprinted
Polymer (MIP),
Polyaniline,
Benzimidazoles

Contamination of food products is an important issue which there is a lot of negligence about it. Primary and secondary contaminations of these products cause such diseases that overtly and covertly lead to death in humans. Micro-organisms and pesticides cause much short-term and long-term intoxication. Short-term intoxication has visible traces, therefore, prevention and rapid recovery is possible, but long-term intoxication resulted from pesticides are associated with serious problems and illnesses.

Unfortunately, a much more important contamination which is found abundantly in food products does not show any research consideration, due to its hidden nature. The contamination is the existing toxins in the agricultural products and indirectly in the protein products. Pesticides which are used by farmers to destroy pests and food products diseases are far more lethal and more problematic than the pathogenic microorganisms.

One of the most common poisons that are utilized in agriculture is the fungicides. Although, the use of fungicides is beneficial for controlling the pathogenic agents in agriculture, but these pesticides can cause illness and death in humans. This project deals with the production of a sensor based on polyaniline and the use of molecular imprinting method to identify three types of conventional fungicides.

Increasing the selectivity of the respective sensor in accordance with conductometry and based on changes in the electrical conductivity of polymer before and after connecting to the desired toxin, by the use of molecular imprinting method for the preparation of polymers is the proposed method in this research work.

Molecular imprinting is the most applicable method for the introduction of molecular recognition properties in synthetic polymers in response of the presence of template species during formation of the three-dimensional structure of the highly cross-linked polymer [1], [2]. However, new MIP formats are being developed to avoid the limitations of the traditional approach: long preparation times, mechanical deformation of the binding sites during grinding of bulk polymers, and a time-consuming sieving procedure [3].

The molecular imprinting method includes the formation of analyte complex (desired poison) with functional monomers in an analyte solution [4]. Analyte will be surrounded by functional and cross-linking monomers in a non-covalent form. After polymerization, a number of analytes, placed at the surface of the polymer, will be washed out by a suitable solvent and will be removed from the polymer's substrate, as a result, cavities to the size of an analyte and with active sites inside the polymer will be formed. In the following, these cavities can be used for trapping the desired poison and eventually, for identification [5], [6]. The electrical conductivity of the polymer is measured once before connecting to the poison (non-imprinted polymer) and once again after connecting to the poison and forming cavities on it. In recent decades, there has been a rapid expansion for this method because of having an easy synthesis, stability and low cost [7].

Carbendazim is a systemic Benzimidazole fungicide with molar weight of 191.19, against smut of wheat and barley which is used for prevention and treatment. Thiophanate-Methyl is a systemic Benzimidazole fungicide with a protective action, molar weight 342.39. Iprodion+Carbendazim are a systemic and contact

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fungicide with molar weight of 594.19 and from the group of de Carbamate+Benzimidazole with wide range of effects for prevention and treatment.

Conductometry is an electrolyte solution containing electrical current and according to equation (1), the Ohm's law can be used for it. Current (I) is a rate of flow and is measured in amps, E is the applied potential difference in volts and R is the resistance of the solution in ohms. Electrical conductivity of the solution is defined as the reverse of the resistance and is shown with a C.

$$E = IR \quad (1)$$

There are two standard methods for measuring the resistivity of semiconductor samples: by the use of two-point technique and a four-point technique.

The four-point technique shows a rapid action in measuring the conductivity and there is no need of having a sample with dimensions and fully certain cross sections. This method is mainly used for samples which have irregular shapes, and only a small flat area of sample is required to contact the probe. Four-point method is just used for those samples which their thickness and the distance of each probe to the nearest edge are at least four times bigger than the distance between probes. The geometric correction can be done for further accuracy of obtained samples.

In this method, four probes are placed on a straight line, on a flat surface of a semiconductor solid sample. A direct current has been passed through the sample by two external pins and the potential difference between them is measured by a voltmeter with the use of two internal needles. The resistance of the sample is calculated by using input current and applied potential difference and the geometrical appropriate factors. The resistance is measured by the formula (2) for circular cross-sections in the four-point technique.

$$P = 2 \pi S \frac{V}{I} \quad (2)$$

P is the resistance of the example; S is the distance between the needles and V is the potential difference and I is the current strength. The conductivity of the sample is obtained by reversing the P value.

Polymeric samples can be pulverized in a mortar to come in powder form. Then, about 0.3 grams of this powder is used to form a round compressed tablet by machines pressing at a pressure of 6 tons. After the thermal equilibrium, we measure the amount of conductivity for polymeric tablets by using the four-point system and then, with the use of equation (2), the amount of conductivity of the prepared polymers can be measured. Needles or probes are at the distance of 0.1 cm from each other.

EXPERIMENTALS

Instrumentals

Fourier Transform Infrared spectra (FT-IR) of the samples in KBr pellets were recorded on an (Perklin-Elmer RX1) spectrometer. To measure the conductivity a four-point conductivity meter by (WTW, Inolab Cond 7110) was used.

The preparation of linear polyaniline polymer with toxin

In a beaker separately for each toxin, 1 gram toxin was dissolved in 20 ml of distilled water and then, 5.0 ml aniline was added to it and placed in an ice-water bath and then it was placed on the magnetic heater. A primer solution containing 1.19 g of dissolved ammonium per sulfate in 10 ml of distilled water was prepared in a beaker and was added drop by drop to the contents of the first beaker within 10 minutes. Polymerization was continued for 2 hours. Then, the solution became smooth by using a Buchner funnel and was dried in an oven at 70 °C and then, their conductivity was measured.

The preparation of non-imprinted polymer (NIP)

Some of the linear polymer from previous step was poured in a beaker separately for each toxin and 5 ml of chloroform was added to it. The beaker was covered with a Para-film and was remained in that condition for 2 hours in order to form template on the polymers. Then, the solution became smooth with a Buchner funnel. At first, it was washed with a small amount of chloroform and then with distilled water and was dried in an oven at 70 °C and then, the conductivity was measured.

The preparation of molecular imprinted polymer (MIP) based on polyaniline

Firstly, eight standard solutions of 0/01, 0/02, 0/03, 0/04, 0/05, 0/06, 0/07 and 0/08 mol/L were made from the toxins separately, in 25 ml of chloroform solvent. Then, 0.1 g was added to each separated solution of non-imprinted polymer (NIP) of toxins. Dishes were covered by para-film and were placed in a fixed location for a period of 4 hours. After this term, solutions became smooth with buchner funnel and dried in an oven at 70 °C and their conductivity was measured.

Investigation of sensing properties of molecularly imprinted polymer based on polyaniline sensitive to toxins

Evaluation of the selectivity of the sensors

First of all, a 0.01 mol/L in 25 ml of chloroform solvent was prepared from three poisons of the benzimidazole family that includes Thiophanate-methyl, Carbendazim and Iprodion+Carbendazim in order to evaluate the selectivity of the sensor. Then, 0.1g non-imprinted polymer of each toxin was poured in a beaker separately and 3 ml of the mixture of three poisons was added to it and placed in a fixed position for 1 hour at room temperature. Then, the solution became smooth with Buchner funnel and was dried in an oven at 70 °C and its conductivity was measured.

Checking the sensor's response time

At first, from the toxins, a 0.01 mol/L standard solution was prepared in 25 ml of chloroform solvent separately. Then for each toxin 5 beakers were taken and each of them was filled with 0.1g of non-imprinted polymer (NIP) of each toxin. 3 ml of the prepared standard solution was added to each beaker. Beakers became smooth with a Buchner funnel after 15, 30, 45, 60 and 75 minutes respectively. Then all of the polymers were dried in an oven at 70 °C and their conductivity was measured.

RESULTS AND DISCUSSION

Molecular imprinted polymer sensitive to carbendazim based on polyaniline

The amount of polymer's conductivity before and after extraction of analyte is as follows:

Polymer conductivity before extraction = 3.2×10^{-4} ms/cm

Polymer conductivity after extraction = 4.3×10^{-5} ms/cm

It can be seen that the conductivity, before being washed with chloroform, is much more than the amount of conductivity after the washing process and this is due to the removal of some carbendazim molecules from the surface of the polymer, in other words, the leaching of molecules that have been absorbed is the reason of this increase.

Investigating the selectivity of the sensor Carbendazim

The polymer's ability in detecting analytes from invasive species, which are structurally similar to analyte (selectivity), is very important for sensor applications. The conductivity of the molecular imprinted polymer of Carbendazim against Iprodion+Carbendazim and Thiophanate-methyl, which is structurally similar to Carbendazim molecule, was 4.6×10^{-5} mS/cm. This conductivity is close to the conductivity of the obtained molecular imprinted polymer after the extraction of analyte, and this result shows the sensitivity and selectivity of the MIP Carbendazim towards this poison.

Molecular imprinted polymer sensitive to Thiophanate-methyl based on polyaniline

The amount of polymer's conductivity before and after extraction of analyte is as follows:

Polymer conductivity before extraction = 2.6×10^{-2} ms/cm

Polymer conductivity after extraction = 2.8×10^{-4} ms/cm

It can be seen that the conductivity, before being washed with chloroform, is much more than the amount of conductivity after the washing process and this is due to the removal of some Thiophanate-methyl molecules from the surface of the polymer, in other words, the leaching of molecules that have been absorbed is the reason of this increase.

Investigating the selectivity of the sensor Thiophanate-methyl

The polymer's ability in detecting analytes from invasive species, which are structurally similar to analyte (selectivity), is very important for sensor applications. The conductivity of the molecular imprinted polymer of Thiophanate-methyl against Iprodion+Carbendazim and Carbendazim, which is structurally similar to Thiophanate-methyl molecule, was 2.9×10^{-4} mS/cm. This conductivity is close to the conductivity of the obtained molecular imprinted polymer after the extraction of analyte, and this result shows the sensitivity and selectivity of the MIP Thiophanate-methyl towards this poison.

Molecular imprinted polymer sensitive to Iprodion+Carbendazim based on polyaniline

The amount of polymer's conductivity before and after extraction of analyte is as follows:

Polymer conductivity before extraction = 8.6×10^{-3} ms/cm

Polymer conductivity after extraction = 2.4×10^{-5} ms/cm

It can be seen that the conductivity, before being washed with chloroform, is much more than the amount of conductivity after the washing process and this is due to the removal of some Iprodion+Carbendazim molecules from the surface of the polymer, in other words, the leaching of molecules that have been absorbed is the reason of this increase.

Investigating the selectivity of the sensor Iprodion+Carbendazim

The polymer’s ability in detecting analytes from invasive species, which are structurally similar to analyte (selectivity), is very important for sensor applications. The conductivity of the molecular imprinted polymer of Iprodion+Carbendazim against Thiophanate-methyl and Carbendazim, which is structurally similar to Iprodion+Carbendazim molecule, was 2.3×10^{-5} mS/cm. This conductivity is close to the conductivity of the obtained molecular imprinted polymer after the extraction of analyte, and this result shows the sensitivity and selectivity of the MIP Iprodion+Carbendazim towards this poison.

The sensor’s response time

The amounts of conductivity and their changes have been reported in [Fig. 1, 2 and 3] against the sensor’s response time for the concentration of 0.01 mol/L Carbendazim, Thiophanate-methyl and Iprodion+Carbendazim at room temperature. It is seen that with the increase in time, the penetration rate of analyte into the polymer cavity will increase. The maximum amount of conductivity is in 75 minutes. Increasing the polymer conductivity and its long response time proves the existence of cavities in the polymer.

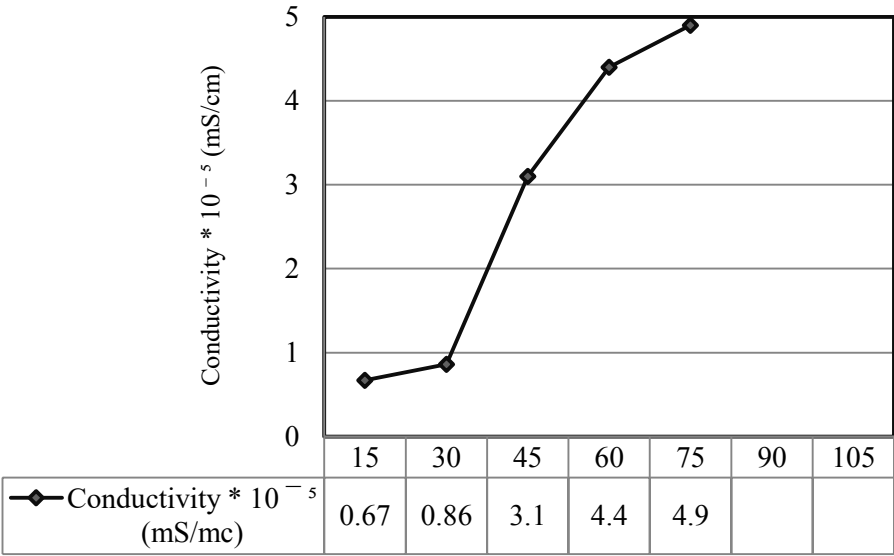


Fig. 1: Conductivity changes based on time increasing for Carbendazim toxin

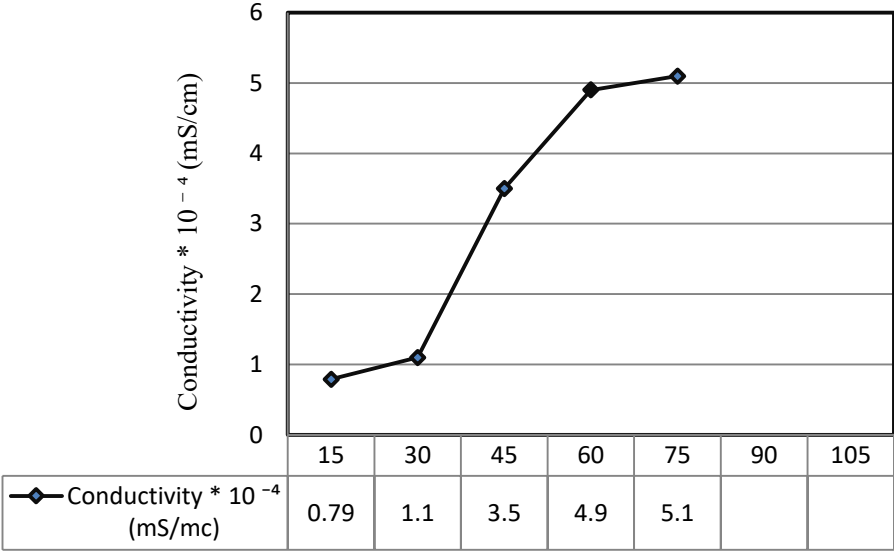


Fig. 2: Conductivity changes based on time increasing for Thiophanate-methyl toxin

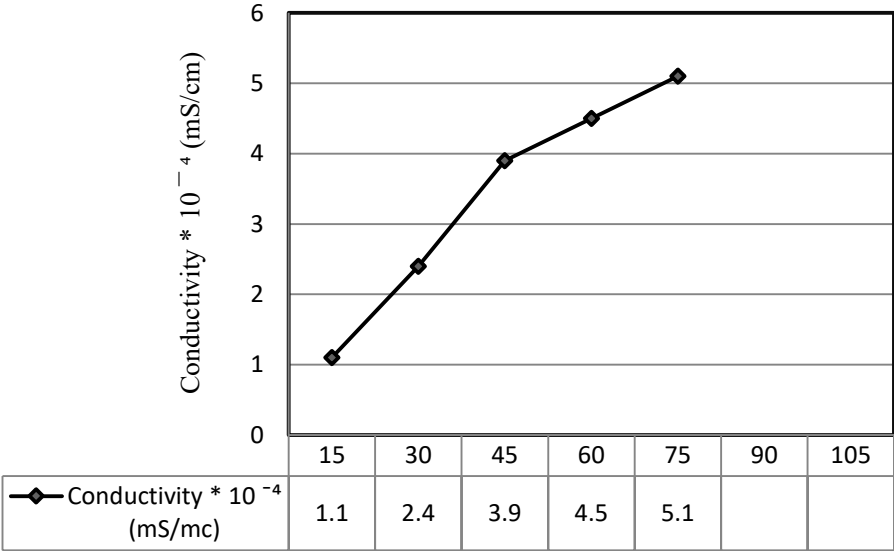


Fig. 3: Conductivity changes based on time increasing for Iprodion+Carbendazim toxin

The impact of analyte concentration

The obtained conductivity values in investigating the impact of analyte concentration and their relationship related to molecular imprinted polymer of toxins has been reported in [Fig. 4, 5 and 6]. At this point, varying concentrations of analyte reacted with the polymer at room temperature for 4 hours. It can be seen that analyte concentration is directly related to the conductivity, this means that with increasing concentration, conductivity will also increase.

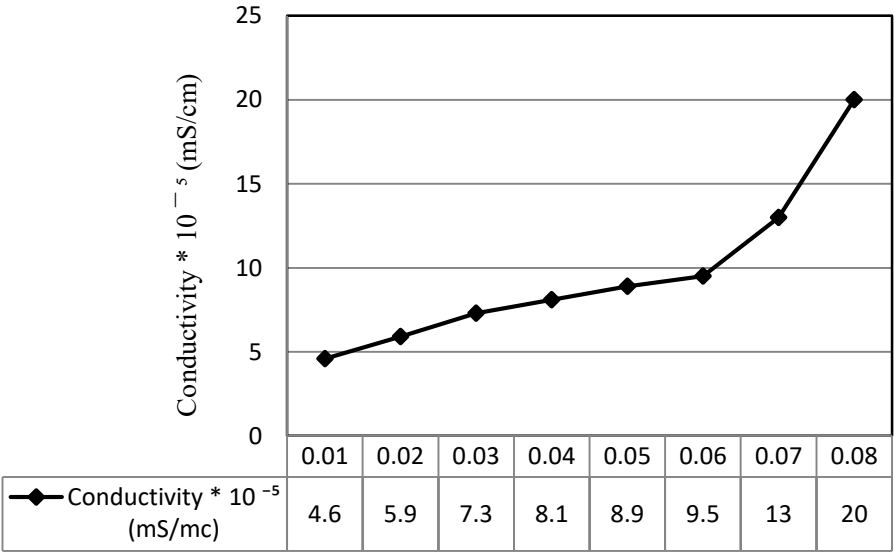


Fig. 4: Conductivity changes based on density increase in Carbendazim

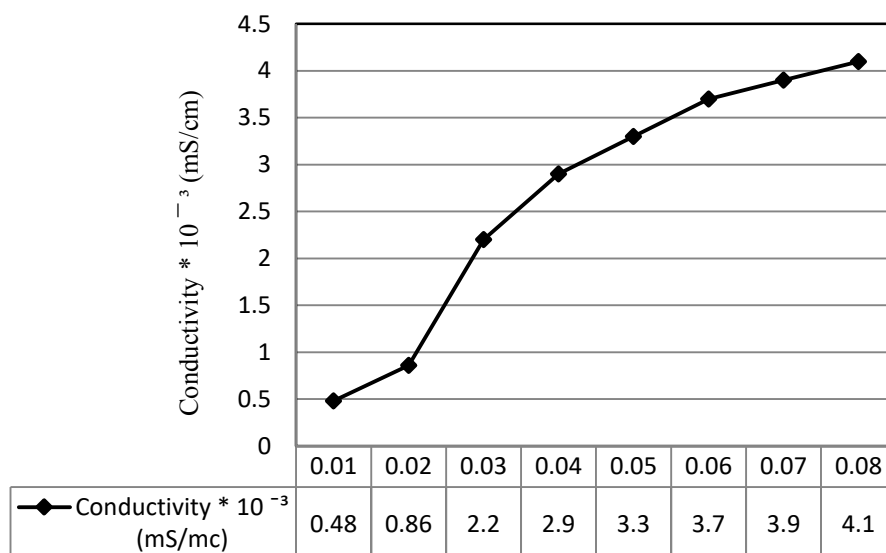


Fig. 5: Conductivity changes based on density increase in Thiophanate-methyl

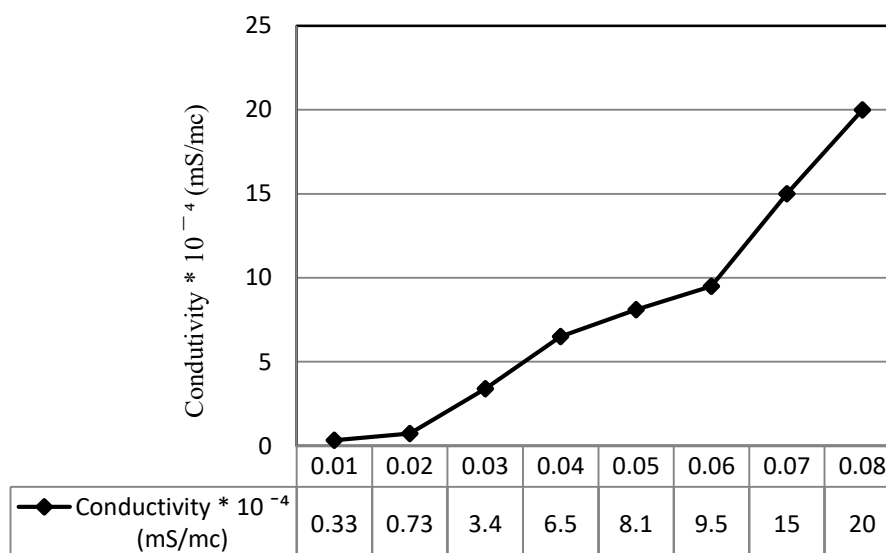


Fig. 6: Conductivity changes based on density increase in Iprodion+Carbendazim

FT-IR Spectroscopy

Spectroscopy has many applications in determining the purity and assessing the structural features and identifying quantification and qualification of compounds. In the following section, some of absorbing frequencies of factorial groups would be described in the ester compounds.

Stretching absorptions of C = C bond will emerge in aromatic rings in pairs (at 3 and 4). The tensile C—N bond in amines will appear at district 5. The tensile N—H bond in secondary aromatic amines has a strong band in the region 6, and its flexural absorption at the secondary amine, will absorb near region 7. C-O stretching, adjacent to the ester carbonyl group, is one of the strongest and most broad bonds in the spectrum. The emergence of a C=C bond, adjacent to the carbonyl group, resulted in the decentralization of π electrons in the bonds of C=O and C=C. This effect increases the simple character of the C = O bond and will decrease its Constant force; as a result, the carbonyl absorption frequency will be reduced. Strong stretching absorptions of C=O and C-O are two manifest characteristics in the spectrum of an ester which appear in ranges of 1 and 2, respectively.

Study the *FT-IR* spectrum of Carbendazim

[Fig. 7 and 8] show spectrums of the molecular imprinted polymer related to Carbendazim, which the peaks of its index include: 1287 cm⁻¹ (stretching vibration of amine C-N) , 1096 cm⁻¹ (C-O ester), 2890 cm⁻¹ (C-H bond), 3210 cm⁻¹ (flexural bond of N-H) , 1488 and 1596 cm⁻¹ (aromatic C=C).

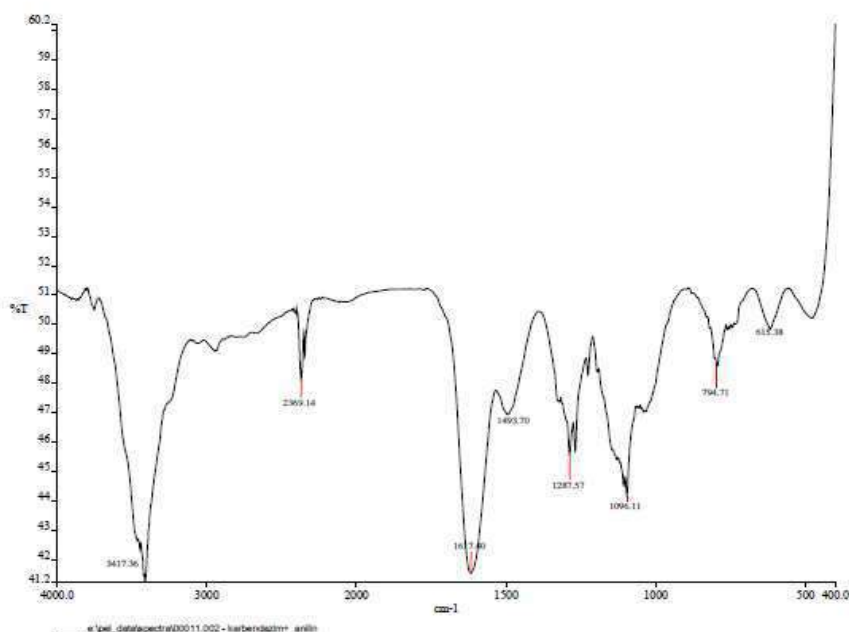


Fig. 7: FT-IR spectrum related to the linear polyaniline polymer with Carbendazim

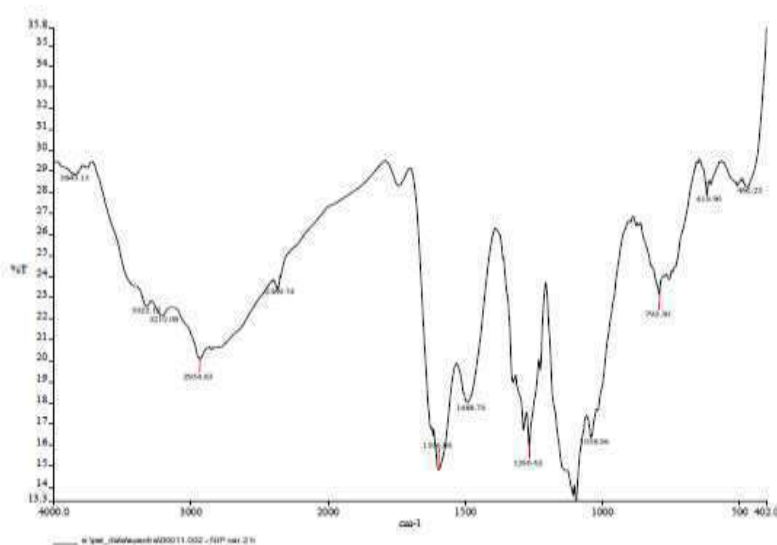


Fig.8: FT-IR spectrum related to MIP polymer of Carbendazim

[Fig. 7 and 8] show spectrums of the molecular imprinted polymer related to Thiophanate-methyl, which the peaks of its index include: 1338 and 1253 cm^{-1} (C-N bond), 1709 cm^{-1} (C=O bond), 2929 and 3140 cm^{-1} (C-H bond), 3186 cm^{-1} (aromatic N-H), 1492 and 1576 cm^{-1} (aromatic C=C), 1160 and 1144 cm^{-1} (C-O ester).

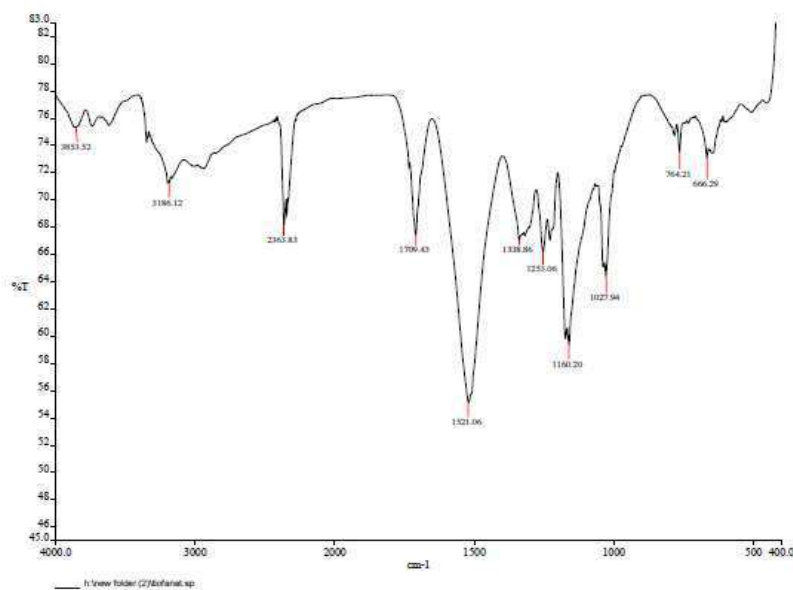


Fig.9: FT-IR spectrum related to the linear polyaniline polymer with Thiophanate-methyl

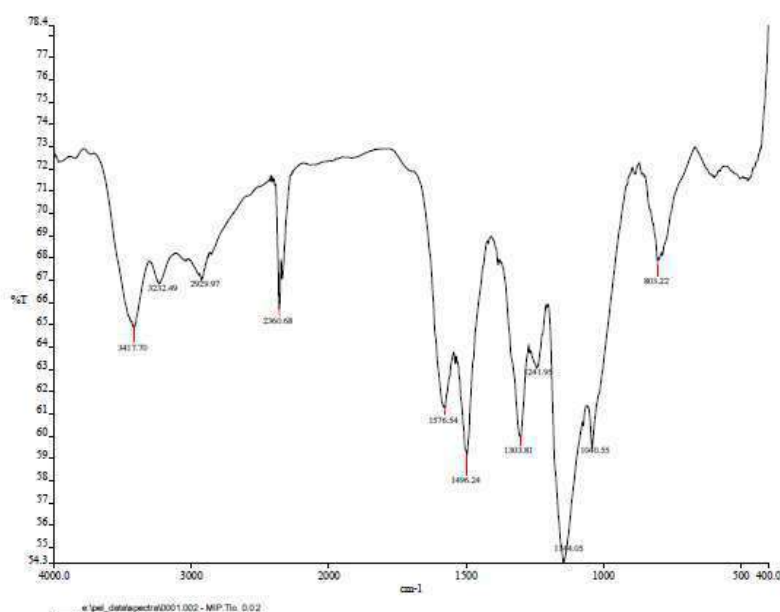


Fig. 10: FT-IR spectrum related to MIP polymer of Thiophanate-methyl

Study the *FT-IR* spectrum of Iprodion+Carbendazim

[Fig. 9 and 10] show spectrums of the molecular imprinted polymer related to Iprodion+Carbendazim, which the peaks of its index include: 127 cm^{-1} (stretching vibration of amine C-N), 1788 cm^{-1} (C=O bond), 3180 cm^{-1} (C-H bond), 3210 cm^{-1} (flexural bond of N-H), 1620 and 1478 cm^{-1} (aromatic C=C), 667 cm^{-1} (stretching vibration of C-Cl).

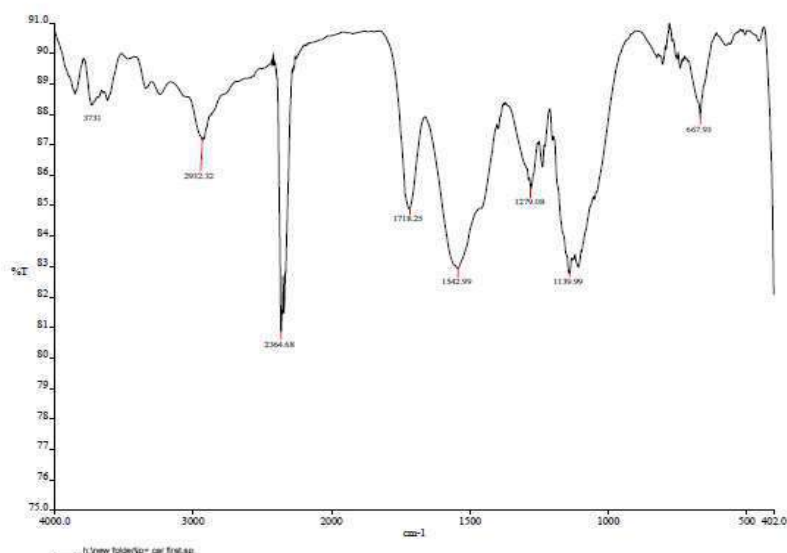


Fig. 11: FT-IR spectrum related to the linear polyaniline polymer with Iprodion+Carbendazim

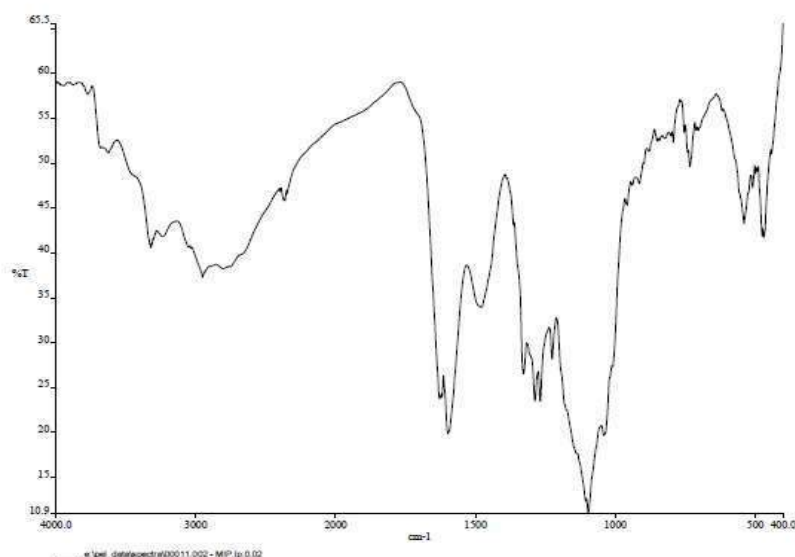


Fig.12: FT-IR spectrum related to MIP polymer of Iprodion+Carbendazi

CONCLUSION

The conductivity of molecular imprinted polymer solutions was tested in 6 periods of 15, 30, 45, 60 and 75 minutes. Investigating results obtained from the conductivity meter, for all three combinations indicate that as the sensor's response time increase, the conductivity will also increase.

The relationship between analyte concentration and electrical conductivity changes were examined by measuring the conductivity of molecular imprinted polymer solutions in 0/01, 0/02, 0/03, 0/04, 0/05, 0/06, 0/07 and 0/08 mol/L concentrations. The investigations based on obtained conductivities indicate that in all three combinations, electrical conductivity will increase with increasing the concentration of studied analyte. About all three cases, the amount of this increase has a significant leap between 0.02 and 0.03 mol/L concentrations.

The results obtained from investigating the sensory effects of toxic compounds of Benzimidazole family indicate that Thiophanate-methyl has the highest electrical conductivity between three examined compounds in all cases of experiment and Iprodion+Carbendazim and then Carbendazim are in the second and third place respectively.

CONFLICT OF INTEREST

Authors declare no conflict of interest.

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REFERENCES

- [1] Wulff G.[2002] Enzyme-like catalysis by molecularly imprinted polymers. Chem. Rev., , 102: 1-27.
- [2] Vasapollo G, Del Sole R, Mergola L, Lazzoi MR, Scardino A, Scorrano S, Mele G.[2011] Molecularly imprinted polymers; Presente and future prospective. Int. J. Mol. Sci., 112:5908-5945.
- [3] Scorrano S, Mergola L, Di Bello MP, Lazzoi M R, Vasapollo G, Del Sole R.[2015] Molecularly imprinted composite membranes for selective detection of 2-Deoxyadenosine in Urine samples. Int J Mol Sci, 16: 13746-13759.
- [4] Ramanaviciene A, Ramanavicius A[2004] Molecular imprinted Polypyrrole-based synthetic receptor for direct detection of bovine leukemia virus glycoproteins. J Polm Sci, 20: 1076-1082.
- [5] Hongyuan Y, Kyung H.[2006] Characteristic and Synthetic approach of molecularly imprinted polymer Int. G Mol Sci7:155-178.
- [6] Takeda K, Kobayashi T, Bispenol A.[2005] Imprinted polymer adsorbents with selective recognition and binding characteristics. Sci. Tech. Adv. Mater. 6: 165-171.
- [7] Mayes A, Whitcombe M J.[2005] Synthetic strategies for the generation of molecularly imprinted polymers. Adv. Drug. Rev. 57: 1742-1778.

ARTICLE

DEVELOPING A MODEL TO PREDICT INTENTIONS CUSTOMERS OF SPORT SHOES: THE ROLE OF CONSUMER VALUES, INVOLVEMENT, THE PERCEIVED QUALITY AND OVERALL SATISFACTION WITH PRODUCT

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ABSTRACT

The aim of this study is to develop a model that includes consumer values, involvement with product, overall satisfaction with product and the perceived product quality and explains their role in purchasing intentions. Including values in the proposed model a prior in purchasing intention is one of the research unique aspects. Data on purchase intentions can help managers to make decisions on marketing related to product demand (new and available products), market segmentation and promotional strategies. The present research is applicable objectively; it is also a survey-descriptive and correlation type, in terms of method. Its population consists of students in Management Faculties of Islamic Azad University in Tehran. According to a valid and reliable questionnaire, to test the research hypotheses, the required data on sports shoes was gathered from 386 students in classroom who were selected by random stratified sampling. Finally, due to the data normality, we tested the hypothesis using parametric methods, Pearson correlation coefficient and SPSS software. The obtained results confirmed four out of five hypotheses so that they show proper fit of the proposed model. There was also a positive relationship between involvements with the perceived product quality. Overall satisfaction and the perceived product quality had a direct and positive impact on purchase intentions and the perceived quality was a priority of consumer's overall satisfaction. However, consumers' values had no significant, direct or indirect effect on purchase intentions; they also had no significant relationship with overall satisfaction. Therefore, consumer's involvement, overall satisfaction and the perceived product quality can be used as predictors of purchase intentions.

INTRODUCTION

Purchase intention is one of the main studied concepts in marketing literature that includes routine use of the conducted consumer research for different purposes (such as new product concept, duplication tests and involvement and classification studies) and vast range of products and services[1]. Marketing researchers are interested to purchase intentions due to its association with purchasing behavior. Several studies have reported a positive correlation between purchasing intentions and purchasing behavior [2]. Furthermore, marketing managers consider consumer purchase intentions to predict sales existing or new products and services. Data on purchase intentions can help managers to make decisions on marketing related to product demand (new and available products), market segmentation and promotional strategies [3].

Previous studies have reported indirect effect of values [4] and involvement[5] as well as direct effect of consumer satisfaction [6] on purchase intentions. There is a discussable problem in the relationship between the perceived quality and purchase intentions. Some researchers have found a direct relationship between the perceived quality and purchase intentions[7, 8]. While, others have reported an indirect relationship for satisfaction mediation [9]. Despite this importance, purchase intentions have not properly explained in marketing.

As a result, the aim of this research is 1) to develop a model that explains a combination of the main concepts of marketing and their role on purchasing intentions; and 2) to examine exploratory behavior of the model. Particularly, values, involvement, satisfaction and the perceived quality were selected after extensive review of marketing literature and the proposed model (Fig 1). Then we have provided and tested conceptual frameworks and hypotheses. Finally, we have concluded by pointing out the research limitations and providing recommendations for future studies.

Research Theoretical Literature

Purchase Intention

Purchase intentions refer the likelihood that customers are going to buy a brand from a product category in a position[10]. Fishbein and Ajzen [11] argue that a person's intention to perform a behavior is his best single predictor for that behavior [1]. According to Fishbein model of behavioral intentions based on Dulaney Control Theory, a person's intention to perform a function behavior is derived from 1) his attitude towards implementing that behavior in a given situation; and 2) norms governing behavior on that situation and his motivation to comply with this norm. The important matter is to consider individuals'

KEY WORDS

Customers' Purchase Intentions, Involvement With Product, Consumer Values, The Perceived Product Quality, Overall Satisfaction With Product, Sports Shoes

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attitude towards executing a behavior, not his attitude towards and object. Secondly, the model requires that attitude is assessed towards a very special situation. Thirdly, attitude toward the considered action is a function of person's beliefs about possible consequences of implementing that action and his assessment on those beliefs [12]. Bagozzi [13] argues that there are three types of purchasing intentions: future-oriented, present-oriented and objective-oriented. Purposeful intentions refer to the consequences that an individual tries to achieve them [14]. Here, as we consider the derived consequences by consumer values, involvements with product, overall satisfaction with product and the perceived product quality, the studied purchase intentions are purposeful intentions.



Fig. 1: The primary model of purchase intentions

The Perceived Product Quality

The perceived quality has been defined as consumer's judgment about overall superiority or excellence of a product. The perceived quality varies with objective quality. The perceived product quality is a global assessment that its characterization is a high level abstraction and refers to special conditions of consumption [15]. The objective quality refers to technical and practical excellence of a product that can be measured [16]. The perceived product quality serves as a mediator between outside clues and the perceived value by customer [17], while it has been discussed that price is one of the most important external clues on product quality [18]. However, Zeithaml [15] suggests that if there are used other clues, there will not be a general relationship between price and quality.

There are contradict findings about the impact of the perceived quality on purchase intentions. Some studies have shown a positive direct impact of the perceived quality on purchase intentions [7, 8], while others report only an indirect impact through satisfaction [9]. In addition, there is no consensus about whether there is an interaction effect between the perceived quality and satisfaction on purchase intentions or not. Some researchers have suggested that there is no interaction effect [19], while others have reported that there is an interaction effect between both concepts on purchase intentions [20]. Rust and Oliver [21] raised two differences between the perceived quality and satisfaction. They considered the perceived quality as a more special concept for entire features of products and services and also satisfaction can be met in next steps (e. g loyalty and expectations). In addition, a company can control the perceived quality in a certain degree. Hence, it is suggested that when the perceived quality and satisfaction are considered as general measures, the perceived quality is perceived as a satisfaction prior and so it is placed before it [19].

Overall Satisfaction with Product

Over the past decades, consumer satisfaction has been extensively studied in marketing. Marketing researchers have not agreed on a general accepted definition on satisfaction. After reviewing the literature and interview with consumers, Giese and Cote [22] have defined satisfaction as a summary affective response with different severity by certain time point and limited duration that have been directed toward new dimensions of purchase and consumption of product.

Consumer satisfaction has been considered as one of the most important concepts [6] and one of the main objectives in marketing [23]. Satisfaction plays a central role in marketing because it is a good predictor of purchase behavior (repurchase, purchase intentions and brand choice) [6]. Because of the importance of satisfaction, there has been developed variety of theories and models to define and explain the concept in consumption process of various products and services. Hope-lack of adopting pattern [24], the perceived performance model [25], documents' models [26], emotional models [27] and special equity models [28] are just some of the major developed theoretical foundations to explain consumer satisfaction. The above-mentioned approaches have created several discussions and issues among marketing researchers. Some questions refer to the following matters: a) which models are best applicable in different situations for different products? [23]; b) satisfaction should be measured with different measurement tools for various products and services; c) definition of satisfaction: it should be defined by focusing on answer (concept) or process (model) [22].

Another issue associated with satisfaction is to measure this concept. Exchange special approach and overall satisfaction approach are two approaches that have been widely used. Exchange special approach considers satisfaction as an emotional response to the recent exchange experience [29], while the perspective of overall satisfaction defines satisfaction as a cumulative assessor answer.

Consumer Values

It has been predicted that values can be significant predictors of attitudes and social behaviors such as consumer behavior. Several marketing researchers have identified values associated with consumer behavior and their effects. Purchase choices have been predicted by ranking values' importance such as weight loss, selecting academic discipline, dependency on political parties and religious involvements [30]. Marketing literature suggests direct impact of values on selection criteria of consumers; they also affect attitudes, intentions and purchase behavior indirectly [4].

Marketing attention to values is resulted by their abstract nature that can be useful in understanding process of evaluating product by consumer. It is argued that values affect the selected criteria by consumers, recognizing a problem, search for information and ideas of consumer. Values affect attitudes, intentions and purchase behavior indirectly [4].

Sherrell et al. [31] studied the relationship between values, brand features and purchase intentions (job involvement). They suggested that individuals' certain value systems affect their attitudes towards compelling communications. Consumers are involved in situations where essential stimulators to achieve their objectives have or when they are important because of their special structure.

However, some studies on marketing literature recommend only indirect effect of values on consumer behavior. A conducted research on the relationship between fashion innovation capabilities with value has suggested that values are not directly associated with consumer behavior, but they are associated with it by shaping opinions, attitudes and lifestyles [32]. Goldsmith [32], suggested that social values are associated with consumer behavior. He found a positive relationship between values such as self-respect with fashion innovation capabilities. Involved people in fashion and interested in the well-dressed have ranked higher values such as excitement, fun, joy in life, respect and success. So social values affect attitudes of consumers and motivate their engagement. Goldsmith et al. [33] reported that fashion leadership is associated with social values such as the excitement, entertainment and joy in life. Finally, it has been suggested that more likely, those products reflect social values that consumers are involved with them intensely [34]. Gift-giving and trying to choose gifts have been associated with some social value, independent of cultural history [35].

Product Involvement

Involvement has attracted wide attention in marketing and has been the main issue in studies about attitude, consumer behavior, convincing and advertising. Product involvement refers the perceived importance of a product class to meet all needs, interests and intrinsic values of consumers [36]. Involvement is identified as situational and stable states. The situational involvement refers to use a product in all purchase situations; and stable involvement is related with consumers' values. Therefore, consumer has low or high involvement with a product based on his considered values [37]. Zaichkowsky [36] divided involvement into two categories: product involvement and brand decision involvement. Product involvement refers to interest of a consumer towards a product category; brand decision involvement refers to available interest to choose a brand.

The possible model of partly verisimilitude, introduced model by Petty et al. [35], is the most widely recognized approach to describe the role of involvement. The possible model of partly verisimilitude explains changing consumer attitudes through central and peripheral routes. Consumer attitudes are changed because lack of his knowledge about that product and cannot do objective assessments. According to the possible model of partly verisimilitude, change is the result of conscious considerations (strengths and weaknesses of the problem are analyzed); while if there is used the peripheral route, attitude will be changed due to lack of positive or negative evidence about it. Therefore, depending on level of involvement, there can be used central or peripheral routes. In situations with high involvement, decision-makers will apply the central route; while in low involvement situations, there will be applied the peripheral route.

Involvement is related with the induced emotions in advertising programs, advertisements processing and donating behavior [38]. Involvement is also associated with behavior of searching and processing data [39], brand loyalty and commitment [40] and frequency of purchasing and spending [41]. Warrington and Shim [42] have suggested a four-quadrant classification model for product involvement and commitment to brand that can be used to classify consumer. Product involvement has a direct impact on level of satisfaction [43] and plays a mediator role between mood and purchasing intentions [5]. In a longitudinal cross-sectional study on car owners, Richins and Blach [43] found that consumers with high product involvement are generally satisfied with their cars than consumers with low involvement in ownership period. Swinyard [5] tried to answer the question whether the effects on mood tailored to different levels of consumer involvement are varied or not. He reported that the effect of mood on purchase intentions is

moderated by involvement. The involved consumers with a good mood have assessed their purchase experiences more favorable than bad mood people. Ultimately, the involved consumers reacted to good and bad purchase experiences more strongly. Mano and Oliver [44] defined involvement as an inherent need to satisfy values or interests of a consumer about a product. According to Oliver and Bearden[45], involvement assessments raises evaluations before using product and the expectations are transmitted to after use evaluations. In addition, the process of consumer satisfaction with high and low involvement is different. Consumers with low involvement use hope-attitude framework, while consumers with high involvement use framework of mismatch and attitude-satisfaction. However, it should be cautious about the results because the research had several limitations.

Hypotheses

The present research attempted to study the role of consumer values, product involvement, the perceived product quality and overall satisfaction on purchase intentions. After reviewing the relevant literature, the following hypotheses were proposed for the research:

H₁: Product involvement is positively associated with the perceived product quality.

H₂: Consumer values are positively correlated with overall satisfaction on product.

H₃: Overall product satisfaction is positively associated with purchase intentions.

H₄: The perceived product quality is positively associated with purchase intentions.

H₅: The perceived product quality is positively associated with overall consumer satisfaction.

The above mentioned hypotheses helped to develop the presented model in Figure 1 so that the research objective was to study the effects of product quality and overall satisfaction on purchase intentions. In addition, there have been also studied direct and indirect effects of product involvement and consumer values with purchase intentions.

The Research Empirical Foundations

METHOD

The present research is applicable objectively; it is also a survey-descriptive and correlation type, in terms of method. It is a descriptive research from perspective of categorizing studies in terms of data collection, or in other words, research design because it describes characteristics of the sample and then generalizes the characteristics to the target population. Descriptive studies include several categories that its survey type was used in the present research. Therefore, in summary, it can be said that the research is a survey-descriptive and correlation type, in terms of method.

Society and Statistic Sample

The subjects: we have considered students as a class of consumers to achieve the research objectives. Its population consists of students in Management Faculties of Islamic Azad University in Tehran: 1) Faculty of Management and Economics, Science and Research Branch; 2) Faculty of Management and Accounting, Tehran Center Branch; 3) Faculty of Management and Accounting, Tehran South Branch; and 4) Faculty of Management and Social Sciences, Tehran North Branch. Finally, we have used sport shoes as the studied product. Although using students can limit generalization of the findings, a relatively uniform sample can be considered as a proper method to test the studied model.

Sampling method and sample size: in the present research, there has been used the stratified random sampling method. Researchers believe if the population (N) is known, sample size can be determined based on sampling size table from the assumed population that was introduced by Morgan and Kerjsi. In this study, as number of total student population is identified, the sample size will consists of 370 students. However, by considering to the possibility that some questionnaires may be filled wrongly and or not returned, there were distributed 400 questionnaires by taking into account the proportion, which there were used 386 questionnaires.

Data Collection Tools

In the present research, data collection tools include laboratory studies and questionnaire. To distribute questionnaires, the study was conducted under research conditions in classroom, where participants were selected based on their information and interests regarding product and answered the research questions. To control the effects of demand, the participants were informed that researchers have no relationship

and dependency with producers or advertising agency for the used products and only want honest answers. There was list of values (LOV), developed by Kahle [46], to measure values. List of values includes nine values: sense of belonging, excitement, fun and pleasure in life, warm relationships with others, self-satisfaction, being respected, sense of success, self-security and self-respect. List of values is a measurement tool that has been extensively used by marketing researchers, which it has shown reasonable validity and reliability. The revised version of Personal Involvement Inventory, developed by Zaichkowsky [36], was used to measure involvements with sport shoes. It contains a bipolar seven-point scale for ten features: important for me, related with me, very meaningful for me, valuable, required, interesting for me, excitement for me, attractive for me, amazing to me and impressive to me. The main assessment tools consist of a 20-item scale, regardless of conditions that measure motivation situation of involvement [36]. These studies have shown that the shorter revised version can be trusted as the primary measurement tool. For this reason, the version was used in the present research. Involvement questions show the reported reliability of 90% that have been widely used in marketing literature to measure consumer involvement with products, advertising and purchase generalization [47]. The subjects were asked to define the possibility of the next position in the relevant product categories and purchase items using a five-point semantic analysis (most likely, not at all likely, very likely, not at all likely, highly possible, not possible, with high confidence, not at all certain). The mean scale items were used to provide a mix baseline to measure purchase intention. This measure of purchase intentions is similar to those used in previous marketing studies [10, 12].

Data Analysis

Firstly, we examined data normality using Kolmogorov-Smirnov Test at confidence level of 95%, as shown in [Table 1]. As seen, in all variables of the research, the significance level (Sig.) is more than the research significance level ($\alpha = 0.05$). Therefore, we will accept data normality hypothesis and we will use parametric methods and Pearson correlation coefficient to examine the hypotheses.

Table 1: Normality test results of the research variables

		Product involvements	Consumer values	The perceived product quality	Overall satisfaction with product	Purchase intentions
Number of data		386	386	386	386	386
Normal parameters	Mean	3.34	2.56	3.51	3.11	3.58
	Standard deviation	.215	.577	.389	.393	.522
Kolmogorov-Smirnov statistic		.481	1.022	1.114	.669	1.395
Significance level (Sig.)		.975	.247	.167	.763	.620

RESULTS

The processes of causal modeling (path analysis) were used to test a proper model and estimate its coefficients. There was conducted a path analysis for representing direct, indirect and mediated casual effects between the considered variables and general proper test for the model to find that whether the model is consistent with the observed correlations or not. Data analysis created correlations in the initial model (Table 2) that varied from low (0.265) to high (0.837), in terms of power. The assumed model was tested by the observed correlations. The results indicated that there were no consistency between model and data, when comparing real correlations with simulated correlations. There were five states with difference more than 0.05 between the observed and simulated correlations. It shows that there are few paths in the model. However, the following four paths were significant at level of 0.05: path coefficient from involvement to the perceived product quality (0.000), path coefficient from the perceived product quality to purchase intentions (0.021), path coefficient from overall satisfaction to purchase intentions (0.006) and path coefficient from the perceived product quality to overall satisfaction (0.000).

Table 2. The observed and simulated correlations between variables at error level of 5%

Variables		Values	Involvement	Perceived product quality	Overall satisfaction	Purchase intentions
The observed correlation	Values	0.0001				
	Involvement	0.327	0.0001			
	The perceived product quality	0.307	0.566	0.0001		
	Overall satisfaction	0.265	0.540	0.837	0.0001	
	Purchase intentions	0.274	0.411	0.521	0.533	0.0001
The simulated correlation	Values	0.0001				
	Involvement	0.363	0.0001			
	The perceived product quality	0.213	0.566	0.0001		
	Overall satisfaction	0.198	0.440	0.836	0.0001	

	Purchase intentions	0.153	0.300	0.520	0.532	0.0001
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The first reviewing of the model was an extra path that moved from involvement toward overall satisfaction. The path was significant at level of 0.05 so that improve the model fit. However, the path was not significant statistically and did not improve data ratio. Therefore, they were not included in final model. Table 3 summarizes the represented direct, indirect and overall casual effects by the model. By starting purchase intentions, the outcome of final interest was determining factor for the most casual impact (0.506) in the perceived product quality and its highest overall effect was due to direct impact (0.338), but overall satisfaction had a greater direct impact (0.379) on purchase intentions. Although its overall impact (.379) was smaller due to the result of lack of direct impact, but the two determinant factors explained almost 19% of variance of purchase intentions. The only determinant factor of the perceived product quality was involvement with relatively high effect (0.566), although it explained only about 20% of the variance. The main determinant factors include overall satisfaction, the perceived product quality with overall impact of 0.782 and involvement with overall effect of 0.540. Values had no impact on overall satisfaction. The determinant factors considered approximately 51% of overall satisfaction variance. In general, it seems that the revised model in Fig. 2 is consistent with the collected data in the research and provides new insights on priorities of purchase intentions.

Table 3. Summary of causal effects in the corrected models

Results	Determinant	Direct causal effects	Indirect casual effects	Total casual effects
Overall satisfaction	The perceived product quality	0.692		0.782
	Values	-0.005		-0.005
	Involvement	0.279	0.414	0.540
The perceived product quality	Involvement	0.566		0.566
Purchase intentions	The perceived product quality	0.338	0.291	0.506
	Overall satisfaction	0.379		0.379

DISCUSSION AND CONCLUSION

The aim of this study was to develop a model that includes values, involvement, satisfaction and the perceived quality and explains their role in purchase intentions. The research provides an improved understanding on the role of these variables on purchase intentions. Inclusion of values in the model, as a prior of purchase intention, is one of unique aspects of the study. Sport shoes were selected as the studied product because they have not been studied in marketing studies. Findings of the present research include various theoretical and functional requirements.

There were confirmed four out of five hypotheses in the research that show proper proportion of the proposed model. Involvements with product had a positive relationship with the perceived quality; overall satisfaction and the perceived product quality had a direct positive impact on purchase intentions; and the perceived quality was a priority of overall consumer satisfaction. Consumers' values had no significant, direct or indirect impact on purchase intentions, and they had no significant relationship with overall satisfaction. Therefore, involvement of consumer, overall satisfaction and the perceived product quality can be used as predictors of purchase intentions.

The research results show new evidence about priorities of purchase intentions, their effects and relations between them so that both the perceived quality and overall satisfaction had almost a direct impact on purchase intentions and acted as a mediator between involvement and purchase intentions. However, both variables explained only a small fraction (20%) of variance of purchase intentions that indicate there are other variables. In addition, findings of previous studies confirm direct and positive effect of the perceived quality on purchase intentions [8] and its indirect impact on purchase intentions through satisfaction [9]. The above-mentioned studies have reported whether the first or second relationship, while this study provides evidence that the perceived quality has both direct and indirect effects on purchase intentions. In general, it indicates the dominant role of the perceived quality on consumer satisfaction and purchase intentions so that when the perceived quality for a product is high, consumers are satisfied and more likely will purchase again.

Involvement has only an indirect effect on purchase intentions through overall satisfaction (additional path) and the perceived product quality. Since involvement and the perceived product quality affect satisfaction significantly, they can be used as predictors of consumer satisfaction. Therefore, the more involvement of a consumer with a product, the more satisfaction on that product. The finding is contradict the obtained results by Mano and Oliver [44] that have reported there is no relationship between involvement with satisfaction. However, it confirms the obtained findings by Richins and Bloch [43]. In addition, product involvement was a significant predictor of the perceived product quality.

Managers should understand the important role of involvement, the perceived product quality and satisfaction to be able to predict purchase intentions and consequently, purchase behavior. All the above-mentioned variables present several managerial implications that are important issues in developing and implementing marketing strategies aimed to create and maintain market share. It seems that the perceived product quality plays an important role on consumer satisfaction and the perceived product quality. Marketing communication strategies (promotional activities and advertising messages) should be designed in a way that emphasize on product features and clues such as price, brand name and objective quality information etc that strengthen the perceived product quality by consumer. Managers can use the clues to strengthen consumer perception of product quality.

Since the mentioned purchase intentions are changed over time (for example, because of increasing prices, sales), marketing managers should be aware of changes in consumer satisfaction, involvement and the perceived quality levels to be able to predict the future behavior of consumers. Involvement with the product has a significant relationship with consumer satisfaction, the perceived quality and purchase intentions. Marketers can try to involve consumers with a product and provide new motivations (messages, ads) to do this work. As consumers with high involvement are active seekers of product information [42], marketers can target successfully them with a showcase at point of sale, the targeted promotional strategies and providing high quality services for customers [41]. Finally, consumer involvement, the perceived quality, consumer satisfaction and purchase intentions should be used for categorizing objectives to identify the most homogeneous consumer groups, targeting the most profitable sectors and implementing communication marketing effective strategies.

LIMITATIONS AND SUGGESTIONS FOR FUTURE RESEARCH

There was used a single product category to test the proposed model for a defined market segment. Data were collected from students in Tehran and may not reflect geographical differences among students. Small variance of purchase intentions should be explained by the model that indicate poor measurement of concepts (such as satisfaction and the perceived product quality) or other priorities.

Future studies can study other groups of consumers such as older populations with different life styles and socioeconomic activities. This model can be used to study the differences between men and women as well as other consumer segments (e. g consumers with high involvement against consumers with low involvement) and can be studied using other consumption categories and consumer groups. Sport shoes are relatively cheap products with high involvement and the future studies can test this model for products with low involvement. Finally, there is required to examine and study the role of values in satisfaction, the perceived product quality and purchase intentions.

CONFLICT OF INTEREST

There is no conflict of interest.

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FINANCIAL DISCLOSURE

None

REFERENCES

- [1] Kalwani, MU, Silk A J. [1982] On The Reliability And Predictive Validity Of Purchase Intention Measures", *Journal Of Marketing Science*, 1, 243-86.
- [2] Morwitz VG, Steckel J, Gupta A. [1996] When Do Purchase Intentions Predict Sales?" Working Paper, Stern School of Business, New York University, New York.
- [3] Tsiotsou R. [2006] The Role of Perceived Product Quality and Overall Satisfaction on Purchase Intentions", *International Journal of Consumer Studies*, 30, 207-17.
- [4] Pitts RE, Jr, Woodside AG. [1984] *Personal Values and Consumer Psychology*, D. C. Health and Company, Lexington.
- [5] Swinyard WR. [1993] The effects of mood, involvement, and quality of store experience on shopping intentions, *Journal of Consumer Research*, 20, pp.271-280.
- [6] McQuitty S, Finn A, Wiley, J.B. [2000] "Systematically varying consumer satisfaction and its implications for product choice", *Academy of Marketing Science* Review [on line] [WWW document]. URL <http://www.amsreview.org/articles/mcquitty10-2000.pdf>.
- [7] Boulding W, Karla, A, Staelin R, Zeithaml, V.A. [1993] A dynamic process model of service quality: from expectations to behavioral intentions, *Journal of Marketing Research*, 30, pp.7-27.
- [8] Parasuraman A, Zeithaml, V. & Berry, L. [1996] "The behavioral consequences of service quality", *Journal of Marketing*, 60, pp.31-46.
- [9] Cronin J, Taylor S. [1992] Measuring service quality: a reexamination and extension", *Journal of Marketing*, 56, pp.55-58.
- [10] Crosno, JI, Freling, TH, Skinner SJ. [2009] Does brand social power mean market might? Exploring the influence of brand social power on brand evaluation", *psychology & marketing*, 26, 91-121.
- [11] Fishbein, M, Ajzen I. [1975] *Belief, attitude, intention, and behavior: An introduction to theory and research*. Reading, MA: Addison-Wesley.

- [12] Bennett PD, Harrell GD. [1975] "The Role of Confidence in Understanding and Predicting Buyers' Attitudes and Purchase Intentions", *Journal of Consumer Research*, 2, 110-17.
- [13] Bagozzi RP. [1978] The construct validity of the affective, behavioral, and cognitive components of attitude by analysis of covariance structures", *Multivariate Behavior Research*, 13:9-31.
- [14] Alwitt, L. F, & Pitts, R. E. [1996] "Predicting Purchase Intentions for an Environmentally Sensitive Product", *Journal of Consumer Psychology*, 5, 49-64.
- [15] Zeithaml, V.A. [1988] "Consumer perceptions of price, quality, and value: a means-end model and synthesis of evidence, *Journal of Marketing*, 52:2-22.
- [16] Monroe KB, Krishnan, R. [1985] "The effects of price on subjective product evaluations", In *Perceived Quality* (ed. by J. Jacoby & J. Olson), pp.209-232.
- [17] Dodds WB, Monroe, KB Grewal D. [1991] "Effects of price, brand and store information on buyers' product evaluations. *Journal of Marketing Research*, 28, 307-319.
- [18] Rao, A.R. & Monroe, K.B. [1989] "The effect of price, brand name, and store name on buyers' perceptions of product quality: an integrative review", *Journal of Marketing Research*, 26, pp.351-357.
- [19] Llusar JCB, Zornoza CC, Tena ABE. [2001] Measuring the relationship between firm perceived quality and customer satisfaction and its influence on purchase intentions, *Total Quality Management*, 12:719- 734.
- [20] Taylor S, Baker T. [1994] An assessment of the relationship between service quality and customer satisfaction in the formation of consumers' purchase intentions", *Journal of Retailing*, 70, pp.163-178.
- [21] Rust, RT, Oliver RL. [1994] Service quality: insights and managerial implications from the frontier", In *Service Quality: New Directions in Theory and Practice* (ed. by R. Rust & R. Oliver), pp. 1-19. Sage Publications, Thousand Oaks, CA.
- [22] Giese JL, Cote JA. [2000] Defining consumer satisfaction", *Academy of Marketing Science Review* [on line] [WWW document]. URL <http://www.amsreview.org/articles/giese01-2000.pdf>.
- [23] Erevelles S, Leavitt C. [1992] A comparison of current models of consumer satisfaction/dissatisfaction, *Journal of Consumer Satisfaction, Dissatisfaction and Complaining Behavior*, 5:104-114.
- [24] Oliver RL. [1980] A cognitive model of the antecedents and consequences of satisfaction decisions", *Journal of Marketing Research*, 17:460-469.
- [25] Churchill GA, Jr, Suprenant C. [1982] An investigation into the determinants of consumer satisfaction", *Journal of Marketing Research*, 19, pp.491-504.
- [26] Folkes VS. [1984] Consumer reactions to product failure: an attributional approach, *Journal of Consumer Research*, 10:398-409.
- [27] Westbrook RA. [1987] "Product/consumption-based affective responses and post-purchase processes", *Journal of Marketing Research*, 24:258-270.
- [28] Oliver RL, DeSarbo WS. [1988] Response determinants in satisfaction judgments", *Journal of Consumer Research*, 14, pp.495-507.
- [29] Oliver, R.L. [1993] "Cognitive, affective and attribute bases of the satisfaction response". *Journal of Consumer Research*, 20:418-430.
- [30] Schwartz S, Bilsky W. [1990] Toward a theory of the universal content and structure of values: extensions and cross-cultural replications", *Journal of Personality and Social Psychology*, 58:878-891.
- [31] Sherrell, D.L, Hair, J.F, Jr & Bush, R.P. [1984] "The influence of personal values on measure of advertising effectiveness: interactions with audience involvement", In *Personal Values and Consumer Psychology* (ed. by R.E. Pitts & A.G. Woodside), D. C. Health and Company, Lexington.
- [32] Goldsmith RE, Stith M, White DJ. [1989] "An empirical study of the relationship between personal values and innovative purchasing behavior", *Development in Marketing Science*, 12:84-88.
- [33] Goldsmith, R.E, Heitmeyer, J.R. & Freiden, J.B. [1991] "Social values and fashion leadership", *Clothing and Textiles Research Journal*, 10:37-45.
- [34] Goldsmith RE, Freiden J, Henderson K. [1994] "Social values, food attitudes, and food consumption", Paper Presented at the Annual Conference of the Society for Consumer Psychology, St. Petersburg, FL.
- [35] Beatty SE, Kahle L.R, Homer P. [1991] "Personal values and gift-giving behaviours: A study across cultures", *Journal of Business Research*, 22, pp.149-157.
- [36] Zaichkowsky JL. [1985] Measuring the involvement construct", *Journal of Consumer Research*, 12, pp.341-352.
- [37] Houston MJ, Walker, B.A. [1996] "Self-relevance and purchase goals: mapping a consumer decision", *Journal of the Academy of Marketing Science*, 24, pp.232-245.
- [38] Tsiotsou, R. [2004] "The role of involvement and income in predicting small and large donations to college athletics", *International Journal of Sport Marketing and Sponsorship*, 6, pp.117-123.
- [39] Bloch PH, Sherrell DL, Ridgway NM. [1986] "Consumer search: an extended framework", *Journal of Consumer Research*, 13:119-126.
- [40] Knox, S. [2003] Empirical developments in the measurement of involvement, brand loyalty and their relationship in grocery markets", *Journal of Strategic Marketing*, 11:271- 286.
- [41] Shim S., Kotsiopulos A. [1993] "A typology of apparel shopping orientation segments among female consumers", *Clothing and Textiles Research Journal*, 12, pp.73-85.
- [42] Warrington, P. & Shim, S. [2000] An empirical investigation of the relationship between product involvement and brand commitment", *Psychology and Marketing*, 17, pp.761- 782.
- [43] Richins, M.L. & Bloch, P.H. [1991] Post-purchase product satisfaction: incorporating the effects of involvement and time", *Journal of Business Research*, 23, pp.145-158.
- [44] Mano, H. & Oliver, R.L. [1993] Assessing the dimensionality and structure of the consumption experience: evaluation, feeling, and satisfaction, *Journal of Consumer Research*, 20:451-466.
- [45] Oliver RL, Bearden WO. [1980] The role of involvement in satisfaction processes, In *Advances in Consumer Research*, Vol. 7 (ed. by J.C. Olson), pp. 250-255. Association for Consumer Research, Ann Arbor.
- [46] Kahle LR, Beatty SE, Homer P. [1986] Alternative measurement approaches to consumer values: the List of Values (LOV) and Values and Life Style (VALS)", *Journal of Consumer Research*, 13:405-409.
- [47] Goldsmith RE, Emmert J. [1991] Measuring product category involvement: a multitrait-multi method study" *Journal of Business Research*, 23:363-371.

ARTICLE

EFFECTS OF HUMOR APPEAL, THE PRODUCT INVOLVEMENT DEGREE AND GENDER ON ATTITUDES TOWARDS ADS AND ATTITUDES TOWARDS BRAND

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ABSTRACT

Being inspired by communication patterns, marketing tries to change the consumers' attitudes. The capabilities of marketing messages in changing the consumers' attitudes depend on the credibility, appeal, method of message framing, its transmission method and the quality of conveying the message. Various appeals in marketing messages can be used in achieving marketing goals. The approach we face today is using humor in advertising for products and services; which has become a prevailing method. This paper studies the effects of humor appeal in commercial ads, the mental engagement of products and gender on attitudes towards ads, and attitudes towards brand, in template of six hypotheses. The research method of this study is trial and the factorial designs in 8 modes or 2 x 2 x 2 situations have been used. The data was collected by questionnaires and pictures. The products studied in this research were ice-cream and mobile phone and college students were the statistical population of the research. The findings showed humor in ads is effective in customers' behavior; however, variables such as gender of audiences and the degree of mental involvement of the products shall be considered as well.

INTRODUCTION

A large portion of advertisement messages which are nowadays reflected and published via mass media has a one sided- invasive, advertisement and complementary nature and for this reason, they lack the necessary efficiency and effects on the audience. In fact, the amount of the message effectiveness on the audience depends on whether or not the audience is recipient of the transmitted message; and if he/she finds it in alignment with his/her demands, interests, views and best interests. In the modern theories of communication science, it has been discussed that a series of steps must be taken in the process of publishing a message to make it effective on audiences. The first step is receiving the message completely, comprehensively, understandably; and being acceptable for the audiences. And, other stage is the effect on audience and acting accordingly. By considering the psychological concepts, the commercial ads use a series of appeals, methods and executive procedures for affecting the audience, attracting the audience and transmitting a message temporarily. In the present research, the product involvement (up and down), the audiences' gender (female and male) and the type of appeal used in the ads (humor and non-humor), effort has been made to measure the degree of effectiveness of those variables on the attitudes towards the ads, and attitudes towards the brand.

THE EXPRESSION OF THE PROBLEM

In the consumption-centered world of today, advertisement is considered as an important element for producers and in this venue, the entrepreneurs and the economic managers of different countries around the world try to introduce and advertise their products by benefitting from specific and new facilities and ideas. This is a highly important subject to see in the pile of the advertisements, what attitudes customers show towards the ads and brands and what factors direct the potential consumers to attempt the purchases. In fact, among large volumes of advertisement messages, audiences only pay attention to messages which appear attractive and appealing to them.

Humor appeal is one of the attractions which are used in advertisement and it has been also studied in the present research. Humor could be effective on the quality of attitude and behavior. Ads with funny contents become more prevailed and known by people, and remain in memory more than other ads; and show stronger effectiveness in attracting the customer. Humorous works are defined by these findings in such an extent that different audiences show reactions to advertisement messages with humor content in various ways. In a study, it was revealed women show more negative reactions to introducing humor in advertisements than men; therefore, since studying the appeals of humor and recipients simultaneously

KEY WORDS

Humor, Mental involvement of product, attitude towards brand, attitude towards ads

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and their effects separately on females and males have been ignored in previous researchers; and hence, it can be taken as a vague issue, this research has tried to study this issue.

Therefore; the main question of this research is: What are the effects of humor appeal in commercial ads, the degree of mental involvement of the product and gender on the attitude towards ads and towards brand?

RESEARCH HISTORY AND LITERATURE

The Elaborative Likelihood Model (ELM) explains how involvement in a stimulating message changes the attitudes of the message recipient. According to this model, the degree of person's involvement in the course of message processing is considered an important factor in determining the path of persuading him/her [1]. Individuals form their attitudes via two persuasive paths; the main path and the auxiliary or side path. In the main path process, if individual can explain the message with more precision, there is a higher possibility of being persuaded; therefore, this message acts stronger when it can be both persuasive and stimulating. In processing the side path, signs such as humor appeal changes individuals' attitudes without going through the message reasoning and arguments. People might be convinced through factors other than the contents of the message; therefore, the humor appeal shall move more through side paths in order to persuade individuals.

The Elaborative Likelihood Model (ELM) [1, 2, 3] suggests that product involvement is one of the important variables that motivates customers in their processing the advertisement. According to this model, if the message recipients have high involvement with the product, they will show more concerns on the message arguments in discussing the characteristics of the brand and its advantages. As a result, the recipients act with more motivation to show more careful precision and form their attitudes via the main path.

When the customers show less involvement in products, using side signs could change their attitudes. Therefore, we assume the involvement of products will modify the effects of emotional appeals on the attitudes, including attitudes towards ads; and the humor appeals on this attitude by customers with low involvement will have more positive effects in comparison with customers with high involvement. On the other hand, since the effects of these appeals on products with high involvement are not studied seriously, this research tries to study their effects simultaneously on two products, one with low involvement and the other with high involvement.

The elaborative likelihood model (ELM) [2] determines when individual's processing motivations, abilities and opportunities are higher, persuading them will take place via main paths. In the absence of any of the mentioned factors, audiences refer to the side process of message based on other signs. When consumer notices the information in a persuasive message is related to him/or or in one way, it will be interesting for him/her, he/she will pay attention to the contents of the message with care. In this condition, it is possible for him/her to think actively on the subjects the marketer presents and develops cognitive responses for these subjects. In our central path, we establish and evaluate beliefs carefully and the strongly formed attitudes direct our goal. The implied conclusion is the factors related to the message specify the amount of change in the attitude. Products with high involvement intend to create main processing; that is, consumers will show the necessary cognitive efforts for assessing arguments and reasoning related to the subject which is shown to them. Under these conditions, consumers incline to focus on high recognition signs including the attitude and performance of information for evaluating the products. In turn, when we actually have no motivation to think about the discussions introduced by marketers, we take the side path towards encouragement. In turn, it is possible to use other signs for making decisions on the method of reacting to the message. These signs include packaging the product, appeal of the resource and/or the environment where the message appears. When consumers do not pay attention to a product, its presentation method (for example, which supports it and/or the images which are shown with it) might become more important.

This question of whether or not humor appeal could be effective for products with low and high products could deserves to be studied more by linking the principles and findings that support the two theories of persuasion. Clearly, according to the side path, the method in which the humor appeal acts in advertisement works at least when product involvement is low. Although, perhaps this might happen for the products with high involvement. Based on the above-mentioned issues, what is anticipated is humor appeal is more effective in the class of products with low involvement than products with high involvement.

This research simultaneously studies the effect of humor appeal in advertisements on the products with low and high involvement and the advantage of this method than other researches is it has separated the audiences based on gender and measures the effects of the mentioned factors on each group; for, studied showed women show more negative reactions than men towards humor in advertisement.

Different definitions have been introduced on the effects of advertisement [4], and for measuring the effects of humor appeals in advertisement, it is necessary to measure some attitudes. The specific attitudes which are studied in this research include attitudes towards advertisement (A_{AD}) and attitudes towards brand (A_{BR}). Although the attitude is structural and exists everywhere, an absence of an integrated

and compatible definition of it could be seen in marketing literature. In any event, there is a general agreement the attitude is followed by an emotional evaluation [5]; and this evaluation could be positive, neutral or negative. One of the most effective theories in marketing research is "attitude towards ads" [6, 7]. The theoretical literature defines attitudes towards ad as "inclination to respond in a desirable or undesirable method to a specific advertisement stimuli in the course of exposure to a specific situation" [8, 9]. Sometimes, individual's attitudes towards something can affect his/her attitudes towards other things which he is in connection with [10]. In this sense, the consumers' enthusiasm to ads could be drawn towards visualization of brand in the same advertisement. Therefore, attitudes towards ads play important role in the effectiveness of consumers' attitudes towards brand and their intention towards purchase in direct and indirect methods. Attitudes that form towards advertisement are effective on the customers' attitudes towards the brand as well as the purchase target of the customers [6, 8]. If the final goal of advertisement is to establish positive attitudes towards ads and brand, increase in the likelihood of purchase or the positive emotional response towards an advertisement could serve as the best index in evaluating the effectiveness of advertisement [11, 12]. Many researchers have shown a positive emotional response to an advertisement has positive and direct relationship with identifying the brand and positive attitudes towards the brand and the purchase goal of customers [11]. It seems when customers like a specific advertisement, perhaps they will like the advertised brand as well and the customer will become more prepared for buying it. It is not important how much time, effort or money are spent for an advertisement, it is important that marketers shall have faith the advertisement with the effects on the attitudes of consumers is considered as a key element in selling products and services.

Attitudes towards brand are inclination to respond to a specific brand in desirable or undesirable method after showing people the advertisement stimuli [13]. In different studies, this result was obtained that attitudes towards brand play an important role in the purpose of purchasing [14, 15, 16].

Researchers showed attitude towards brand which is defined as inclination to responding a specific brands in a desirable or undesirable method [6], is affected by attitude towards ads [17, 18]. As there is more probability the side signs could affect the attitude towards ads for the products with low involvement, attitudes towards ads must be more effective on the attitudes towards brand among products with low involvement [6]; therefore, it is anticipated humor appeal have more positive effects on the attitudes towards brand in the products with low involvement than products with high involvement.

RESEARCH HYPOTHESIS

Hypothesis one: The customers' gender has significant effect on customers' behavior (attitude towards ads, attitude towards brand).

Hypothesis two: The degree of mental involvement of the product has significant effects on customer's behaviors (attitudes towards ads, attitude towards brands).

Hypothesis three: Humor in advertisement has significant effects on customer's behaviors (attitude towards ads, attitude towards brand).

Hypothesis four: There is a significant interaction between customers' gender and the degree of mental involvement of products in affecting the customer's behavior.

Hypothesis five: There is a significant interaction between the customers' gender and the amount of ads humor in affecting customer's behavior (attitudes towards ads, attitudes towards brand).

Hypothesis six: There is a significant interaction between mental involvement of the product and humor in advertisements in effecting customer's behavior (attitudes towards ads, attitude towards brand).

METHOD

In terms of goal, the present research is applied or work-bound and the research methodology used in this research is experimental. trial. The factorial designs 2 x 2 x 2 in 8 modes or conditions are used.

Selection of products: In first stage, by using the questionnaire of Ph.D. students in merely marketing area, we divided the class of products as per high and low involvement. In the inferential analysis and extracting the results of the research for selecting the goods, the one-factor variance analysis (ANOVA) was used. After making the analysis, ice-cream was chosen as a product with low involvement and mobile phone was chosen as a product with high involvement.

Selecting the brand name of the products: Since the goal of this research is to study the effect of humor appeal and confirmers in advertisements on the three variables of attitude towards ads, attitudes towards brand and the purchase purpose of the customer; with respect to the previous researches and considering the previous researches and the fact that individuals have some attitudes and beliefs (whether positive and negative); thus, one brand has been made for each product subject of study in this

research, which do not exist in the market so the respondents will have no previous mentality. For the ice-cream, a brand named “Chana” (meaning brunch) was selected which could be suitable for the messages in the ads; and for mobile phone, “Zino” meaning (In Farsi) living and durable was chosen.

Manipulating variables: Two ads (humors and non-humorous) were produced for each product. The products were selected with respect to the intensity of their involvement (high involvement and low involvement). The audiences were divided as per gender (female/male) to study their attitudes towards ads, brand and their purpose of purchases.

Statistical population, taking samples and size of the sample: This study was performed in Azad University, Science and Research Branch, which is one of the reputable universities of Iran. In this study, the number of states which were considered was 8 (2 x 2 x 2). Therefore, by the assumption of giving one scenario to each subject at random, the number which is considered per scenario is for 30 subjects. This number has been obtained based on past studies [19]. The number which is considered is in total 240 subjects. Each subject saw one picture and answered the questionnaire. The questions developed for attitude to brand is in five option semantic differentiation; and the questions for attitudes towards ads were in the five-question Likert type.

Data Analysis methods and tools: The data analysis methods in the present research were inferential statistics in parametric type. In the present study, MANOVA statistical methods were used as required and for data analysis; and the research hypothesis has been analyzed by using SPSS software.

RESULTS AND CONCLUSION

Based on the results obtained from variance analysis, the Fischer Statistic on the two variables of attitudes towards ad and attitudes towards brand in the three variables of the existence of humor, gender and mental involvement were higher than critical value; and in another expression, the significance level which has been calculated is smaller than 0.05. As a result, the hypothesis zero (0) is rejected in 95% level and the difference of mean (score) in attitudes towards ads and attitudes towards brand in both female and male groups, the existence or absence of humor and high and low mental involvement is confirmed. In addition, the results obtained reveal the existence of interactive effects of involvement and humor; and the mental involvement is rejected (the significance level became more than 0.05)[Table 1 & Table 2].

Table 1: The indexes of central trend and dispersion of dependent variables as per the independent variables

Dependent variable	Factors	Levels	Mean	Criteria deviation
Attitudes towards ads	Gender	Male	24.19	7.22
		Female	28.58	7.71
	Involvement	High involvement	24.42	7.99
		Low involvement	28.35	7.06
	Humor	No humor	23.91	7.70
		Humorous	28.86	7.05
Attitudes towards brand	Gender	Male	19.50	6.13
		Female	23.53	6.67
	Involvement	High involvement	19.72	6.97
		Low involvement	23.31	5.93
	Humor	No humor	19.71	6.73
		Humorous	23.32	6.20

Table 2: Results of three-side variance analysis related to the variables of attitudes towards ads and brand

Source of changes		Mean square	F Value	Significance level	Size of effect	Results
Humor	Attitudes towards brand	1566.019	50.057	0.000	0.096	Confirmed
	Attitudes towards ads	2945.252	70.894	0.000	0.131	Confirmed
Involvement	Attitudes towards brand	1551.602	49.597	0.000	0.095	Confirmed
	Attitudes towards ads	1844.752	44.404	0.000	0.086	Confirmed
Gender	Attitudes towards brand	1948.102	62.271	0.000	0.117	Confirmed
	Attitudes towards ads	2318.802	55.815	0.000	0.106	Confirmed
Involvement *Humor	Attitudes towards brand	1691.252	54.060	0.000	0.103	Confirmed
	Attitudes towards ads	2283.769	54.971	0.000	0.104	Confirmed
Gender*humor	Attitudes towards brand	11.102	0.355	0.552	0.001	Rejected
	Attitudes towards ads	3.502	0.084	0.772	0.000	Rejected
Involvement *Gender	Attitudes towards brand	0.019	0.001	0.980	0.000	Rejected
	Attitudes towards ads	0.752	0.018	0.893	0.000	Rejected

Involvement*Humor Gender	Attitudes towards brand	31.519	1.007	0.316	0.002	Rejected
	Attitudes towards ads	1.752	0.042	0.837	0.000	Rejected
Error	Attitudes towards brand	31.284				Rejected
	Attitudes towards ads	41.545				

- A) With regards to the mean score of responses, it could be said the attitudes towards ads and brand were stronger in females; therefore, it can be concluded when the customers are female, the mean score in attitude towards ads and brand is higher than when the customers are male. The degree of the effect shows attitude towards brand was affected by the gender in 11.6% and the attitudes towards ad was effective in 10.6%.
- B) By considering the mean score of responses, the attitude towards in brand and ads in high involvement level is higher; thus, it could be concluded when involvement is higher, the mean score of attitude towards the brand and ads will be higher from the time when the involvement is lower. The size of the effect shows attitude towards brand was affected by involvement in 9.5% score and the attitude towards ads was affected in 8.6%.
- C) By considering the mean value of responses towards brand and ads is higher in the existence of humor; thus, it can be concluded when there is humor involved, the mean score of attitude towards brand and ads will be higher from the time when humor is absent. The value of the size of effects shows that attitude towards brand was 9.6% affected by the humor existence and the attitude towards brand was affected 13.6%.

SUGGESTIONS FROM THE PRESENT RESEARCH

1. First, it is recommended to conduct a research similar to the variables similar to actual ads and brand.
2. In the next researches, different products could be used.
3. In this research, humor add appeals are used and in the future researches, those appeals can be changed.
4. In the present study, the inquired persons were college students and in the next researches the heavy users of the same product can be questioned.

SUGGESTIONS FOR FUTURE RESEARCHES

1. Based on this, the advertisers shall try to use suitable advertisement appeals based on the amount of product involvement (low involvement, high involvement) as well as the gender of audiences.
2. As the results show, in case of the existence of humor in ads, attitudes towards ads and brand increase. Ads with more humorous contents become more popular and remain in mind more than other ads; and, by creating positive feeling, they have positive stronger effectiveness in attracting customers. The marketing specialists shall pay attention to this point that for sensitive goods with high involvement, using humor does not have much application and are mostly used in advertising goods with low involvement.
3. In general, the results showed when the products have higher involvement; marketers shall act very cautious in designing the ads and their contents. Since the risk of buying and the price of those goods are very high, audiences proceed with more care and pay less attention to the advertisement appeals.

CONFLICT OF INTEREST

There is no conflict of interest.

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REFERENCES

- [1] Petty RE, Cacioppo JT. [1986] Communication and Persuasion: Central and Peripheral Routes to Attitude Change, Springer-Verlag, New York, NY, pp. 123-205.
- [2] Petty RE, Cacioppo JT, Goldman, R. [1981] Personal involvement as a determinant of argument-based persuasion, Journal of Personality and Social Psychology, 41(5): 847-855.
- [3] Heath TB, Mothersbaugh DL, McCarthy MS. [1993] Spokesperson effects in high involvement markets", in McAlister, L. and Rothschild, M.L. (Eds), Advances in Consumer Research, Vol. 20, Association for Consumer Research, Provo, UT, pp. 704-8.
- [4] Cook WA, Kover AJ, [1997] Research and the Meaning of Advertising Effectiveness: Mutual

- Misunderstanding" in William D.Wells [Ed] Measuring Advertising Effectiveness [PP. 13-20), Lawrence Elbaum Associates, New Jersey, USA.
- [5] Eagly AH, Chaiken S. [1993] The Nature of Attitudes in A.H. Eagly and S, Chaiber [Ed.], The Psychology of attitudes, 1-21. Ft. Worth, TX Harcourt.
 - [6] MacKenzie SB, Lutz RJ. [1989] An empirical examination of the structural antecedents of attitudes toward the ad in an advertising pretesting context", *Journal of Marketing*, 53(1): 48-65.
 - [7] Bruner GC, Kumar A.(2000), Web commercials and advertising hierarchy of-effects, *Journal of Advertising Research*, January/April, pp 35-42.
 - [8] Mackenzie S.B, Lutz RJ, Belch G.E. [1986], " The Role of Attitudes towards the Ad as a Mediator of Advertising Effectiveness: A test of competing Explanations", *Journal of Marketing Research*, 23:130-143.
 - [9] Biehal G, Stephens D, Curlo E. [1992] Attitude toward the Ad and brand choice. *Journal of Advertising*, xxi (3), 19-36.
 - [10] Hoyer WD, MacInnis DJ. [1997] U.S.A: Consumer Behaviour.
 - [11] Brown Steven P, Stayman Douglas M.[1992] Antecedents and consequences of attitude towards the ad: a meta-analysis", *Journal of Consumer Research*, 19(1): 34- 51.
 - [12] Aaker DA Stayman DM.[1990] Measuring audience perceptions of commercial and relating them to ad impact, *Journal of advertising research*, 30(4):7-17.
 - [13] Phelps JE, Hoy MG. [1996] The Aad-Ab-PI Relationship in children: the impact of brand familiarity and measurement timing. *Psychology & Marketing*, 13(1):77-101.
 - [14] Goldsmith RE, Lafferty BA. Newell SJ. [2000] The Impact of Corporate Credibility and Celebrity Credibility on Consumer Reaction to Advertisements and Brands. *Journal of Advertising*, 29(3):43.
 - [15] Yi Y. [1990] Cognitive and Affective Priming Effects of the Content for Print Advertisements. *Journal of Advertising*, 19(2): 40-48.
 - [16] Shimp T A, Gresham L G. [1985] Attitude toward the advertisement and brand attitudes: a classical conditioning perspective. *Journal of Advertising*, Vol. 14 [1], 10-18.
 - [17] Mitchell A, Olson JC. [1981] Are product attribute beliefs the only mediator of advertising effects on brand attitudes? *Journal of Marketing Research*, 18 (3): 318-332.
 - [18] Gardner MP. [1985], Does attitude toward the ad affect brand attitude under a brand evaluation set?, *Journal of Marketing Research* , 22 [2]: 192-198.
 - [19] Keh Hean T, Run Ren, Sally R Hill, Xuan Li [2013] The Beautiful, the Cheerful, and the Helpful: The Effects of Service Employee Attributes on Customer Satisfaction, *Psychology and Marketing*, 30(3), 211-226.

ARTICLE

THE CALCULATION OF BRAND VALUE AND STUDYING JOINT EFFECTS OF BRAND VALUE AND ADVERTISING EXPENDITURE ON COMPANY'S FINANCIAL AND STOCK RETURN

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ABSTRACT

There are two prevailing approaches toward measuring a company's brand value: customer-oriented approach and corporation-oriented approach. The customer-oriented approach is the same as marketing and behaviorists approach; and corporation-oriented approach is based on financial data. In this study we have applied one of the most recent methods of calculating brand value, which evaluates all three dimensions of market, finance and accounting, and is known as the corporation achievement. Then we tested the joint impact of brand value and advertising value on a corporation's financial performance and on stock return research model, using unbalanced data panel including 378 observations on 27 food industries in Tehran Exchange Stock over a period of twenty-one year old (1994-2014). According to the results the joint impact of advertising budget and brand value on return on assets (ROA) is confirmed as an indicator of corporation's financial performance. However in the case of stock return, only the impact of brand value is confirmed.

INTRODUCTION

According to Aaker [1], the most important assets of a company are the intangible assets. The main problem; however, in measuring of intangible assets impact is that they are normally not capitalized and not appear in a company's balance sheet and financial statements. Currently companies have become more aware of the importance of their intangible assets. In the past, value of a company was all determined by its tangible assets such as physical assets like land or buildings, or capital funds and investments. Understanding the concept of brand management can determine brand equity status and probably impact of intangible assets. Organizations spend high levels of capital for advertising, marketing and promoting activities, which is helpful for both their products and the whole organization [2].

Advertising has been a kind of strategy applied by most of organizations in order to create brand value [3]. Brand in recent years has become to one of the most popular marketing topics. The estimated value of a company's brand sometimes constitutes a significant part of company's physical assets. In this study, in absence of a resource to calculate and publish brand values of companies, we have calculated their brand values. There are various approaches toward measuring brand value. Financial approach suggests that brand value should be measured based on financial calculations of the indicators of financial statements. However according to behavioral approach, the method of attitude measurement shall be used [4]. In this study, brand value is calculated using financial approach. There are limited numbers of researches which measures brand value and advertising financial results. Marketing managers are always pushing pressure to increase marketing and advertising budget. According to Rust et. al. [5], marketing managers have not been held accountable to demonstrate the effect of advertising and marketing on shareholder value. The lack of accountability of this effect can threaten the standing of the marketing function within firms [6]. Therefore in this study we tried while using a proper method to evaluate the company's brand, present answers to questions such as the impact of company's brand and advertising expenditure on financial performance and stock returns.

According to Philip Kotler[7] a brand can be defined as a name, term, sign, symbol, design or a combination of these that distinguishes the maker or seller of a product or a service from other competitors'.

LITERATURE REVIEW

Macro Approaches to Defining Brand Value: Brand value can be analyzed based in both marketing and financial approaches. Farkuhar's first definition of brand value is stated as: It is the value that a brand adds to a product [1,8]. Aaker[9] defined brand value as a set of assets and liabilities related to the brand,

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which is calculated considering the value of the product or services offered. High brand value is considered as a competitive advantage, because the make the company be able to put a higher price for its products, develop a better commercial leverage, increase sales margin and profits and decrease its vulnerability [10]. Keller [11] suggests that when a customer reacts to a well known brand as desired, we can say the brand creates a positive value in the customer's mind. Also when customers react to marketing activities related to a specific brand as not desired, the brand creates a negative value in the customer's mind [11].

Financial Approaches toward Brand Value Measurement: There are different approaches toward measuring brand value. According to Granense & Guilding, there are four approaches or evaluation methods: Cost Based Approach, Market Based Approach, Income Based Approach, and Formulary Approach.

Cost based approach measures capital expenditures allocated to build and maintain brand. Historical cost method explains how discount rate can be used in accordance with applied historical expenditures in present value. Market based approach can calculate brand value and price of brand. Income based approach focuses on future Potential of brand. This approach can determine company's future net income derived from brand, and then discount it for calculating present value of brand. Formulary approach includes several criteria for determining brand financial value. This is a proper approach for internal management goals and financial reporting to out of organization. In this method, an indicator to measure brand profitability is essential. The Inter Brand, For example, as a consulting company uses this method to evaluate Brand value [4]. There also is another method applying in the calculation of brand value, named corporation achievement method, which is the base of calculating brand value in this study and will be fully explained in methodology section.

The Resource Based Review has been the framework for the test of hypotheses in this study. The Resource Based Review (RBV) attributes the competitive advantage of a corporation to its total resources. In accordance with this approach, all assets of a corporation, its particular capabilities, organizational processes, business features, its information and knowledge, and anything helping organization to increase its efficiency and effectiveness are regarded as the corporation's resource [12]. This theory is related to corporation asset and brand value, and the relationship between them and return on assets (ROA). Central to the RBV approach is the theory that firm growth is equally sustained by a company's internal resources in addition to its external resources [13].

Since a brand is considered as an asset, which creates current and future income and cash flow in the organization, therefore market value of the organization and consequently shareholders value should be affected by brand value [14]. Therefore in this study, the brand value as an internal resource which is known as a part of intangible assets is considered as a key factor in the growth of organization. Brand related advertising develops competitive advantage and prevents entrance of new competitors to a market. Advertising turnover can measure the effectiveness and efficiency of conversion of advertising expenditure to positive and long-term brand value for a corporation [2].

Dutordoir, Verbeeten and Beijer [15] studied the effect of changes in brand value on stock return. This study assumed that positive reaction of stock prices against changes in brand value of companies with high cash flow, and valuable growth opportunities with high potential in manufacturing new products or presenting new services will experience an enhancement. This study is based on information of 503 company's brand value announced by Interbrand during 2001 to 2012. These researchers found some evidences indicating the abnormal stock returns are obtained in dates of brand value announcements. Another result of their studies suggested the importance of brand in general growth of organization. However they couldn't find any evidence showing that high brand value creates a possibility in increasing the prices.

Billet , Jiang and Rego [16] research was about the impact of customer perceptions of a company's product on its return in stock market. They examined consumers' believes of 1200 brands and found out a brand with high prestige is an important factor in creating an opportunity in the stock market.

Belo et. al. [17] have defined a company's brand as following: It is an intangible asset that demonstrates the value that customers see in products of that company comparing other competitors. Therefore a brand is a great competitive advantage for a company. They tested the role of brand in risk and value of companies. Their evaluation of brands were in accordance with the companies' advertising expenditures; as a result they found out that a company focusing on its brand has more sock returns than others.

Ruenrom and Pattaratanakun [18] evaluated Corporate Brand Success (CBS). They suggest a new method for brand evaluation that includes three factors of market, Finance and accounting. They studied the relation between brand and sales income. According to the results there was a direct relationship between a company's brand and its sales.

Krik et. al. [19] examined the relation between brand value and company's value. They stated stock market value of a company demonstrates total value of present and future income estimated by shareholders, and this value includes both tangible and intangible assets. Therefore they assumed there is

a direct relationship between company's brand and stock market value. Their studies approved their assumption.

Peterson and Jeong [20] examined the effect of research and development budget and advertising on brand value and financial performance of a company. The results indicated a significant relationship between marketing activities financial performance of the company.

Montanges and Van Riel [14] examined the relationship between brand value and shareholder value. In this study the brand values of 43 companies in Denmark during 1993 to 1997 were calculated. They found a significant relationship between changes in brand value and changes in shareholder value. This study considered three factors of total shareholder return, earnings per share and market-to-book ratio as shareholder value.

Hozier and Schatzberg [21] conducted a research about stock return and organization performance regarding advertising expenditures. These researchers examined stock market reaction and selected organizations' performance in relation with advertising announcement of the Wall Street Journal. They had recorded a decline in the stock market value before the announcement. This decline was also observed in operating and cash income.

Literature Review in Iran: Nikoukar et. al. [22] studied on factors affecting brand equity. In addition to reviewing and evaluating previous models, they presented a new model for calculating the brand equity, and finally by providing a balance sheet and a numerical formula, they introduced a mathematical model to measure the approximate value of the brand, then implemented it in a sample company.

Abdollahkhani and ebrahimi [23] tried to calculate brand value using the method of corporate brand success. Their research was about the relationship between company's brand value and its market share. They concluded that there are direct relationships between company's brand value and sales, and between company's brand value and stock market value.

MATERIALS AND METHODS

This study, regarding purpose, is an applicable research, and considering nature, is a correlational one, which its results can be helpful for a wide range of researchers.

Research Hypotheses: In accordance with research literature [24] the resource based view is the basic foundation of first hypothesis. Marketing decision of a company can seriously affect financial performance of it. Therefore there is a hypothesis that brand value of a company and its advertising expenditure can jointly affect return in assets of the company [as the company's financial performance indicator]. As a result, our first hypothesis can be stated as following:

Hypothesis 1- Advertising budget and brand value are jointly and positively associated with return on assets (ROA).

Return on assets is a financial indicator demonstrating profitability and success of the company, while what is appealing for shareholders is return on their investments. Therefore the resulted hypothesis is as following:

Hypothesis 2- Advertising budget and brand value are jointly and directly associated with stock return.

Population, Sample and Time Period of the research: In this study we desire to calculate brand value of manufacturing company which their products were used by general consumers. We also want to examine the impact of this value and advertising budget of companies on their financial performance and stock return. According to our studies and interviews done with professors, companies activating in the food industry were selected as the population. Considering the selected population, 27 companies and their data from 1994 to 2015 were studied. Rah Avard software was used for collecting needed data, which is available in the library of Stock Exchange Organization.

Since the studied population in this research involves food industry companies active in Tehran Stock Exchange, that their financial statement data is available, we used systematic elimination sampling method, which is a non-probability sampling method. Therefore the method will be non-probability sampling and on the basis of information required, the selections will be judgmental. Excel and Eviews softwares are used in order to do calculations, preparing data and analyzing them.

Research variables: This study involves two dependant variables and two independent variables. Brand value and advertising expenditures has been studied as independent variables; and return on assets and stock return has been studied as dependent variables. The relationships between variables can be demonstrated as the following model [Fig. 1]:

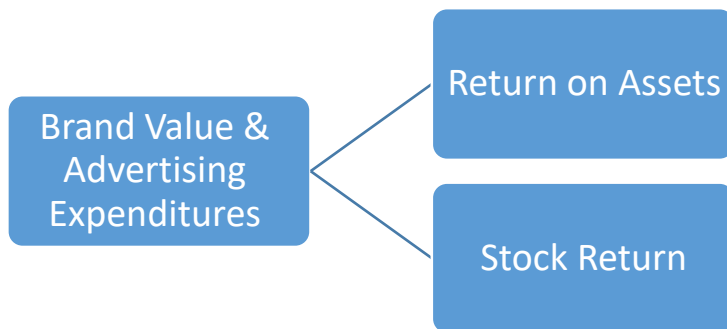


Fig. 1 :The relationships between variables can be demonstrated as this model [24]

Brand Evaluation: In this study, the Corporate Brand Success [CBS] valuation, introduced by Ruenrom and Pattaratanakun [18], has been used to measure the brand value.

Corporate Brand Success Valuation [CBS]: Enterprise value and company's brand value are two concepts, which were used to measure CBS. They have been calculated in two following steps:

Step 1: The Calculation of Enterprise Value

In order to calculate enterprise value, company's market value, acquired by stock market value multiplying stock numbers of company, should be added to the proffered stock value [in the case of existence) and also current liabilities. Finally the whole available cash should be subtracted from the result.

$$\text{Enterprise Value} = \text{MV} \times \text{Q} + \text{Preferred Stock (if any)} + \text{Current Liabilities} - \text{Cash}$$

Step 2: The Evaluation of Company's Brand

Clearly, the value of an enterprise includes all tangible and intangible values of the enterprise. Therefore brand value of a company includes factors such as awareness, distinction, honesty, superiority, attraction, market share, quality and stability comparing others. With regard to the fact that brand of a company is an intangible asset [11], In order to measure company's brand value: total book value of assets, except cash, shall be deducted from the value of corporation and then the company's goodwill value which is an intangible asset shall be added. The result indicates the company's brand value that can be a reflection business performance of the company. This equation includes all three financial, marketing and accounting dimensions:

$$\text{Brand [CBS Valuation]} = \text{Enterprise Value} - [\text{Book Value of total Assets} - \text{Cash}] + \text{Goodwill}$$

RESULTS

Data Description and Sample Characteristic: The first step in analyzing data is to describe or summarize the data, using descriptive statistics. For this purpose, the descriptive statistics has been used to clarify the state of variables and the sample group, and findings are explained by means of statistical language.

The Dependent Variables' Descriptive Statistics: Return on stock and return on assets have been considered as dependent variables of this study. The results of measuring central tendencies and dispersion of dependent variables are presented in [Table 1]. The information presented in this table indicates that the there is no significant deviation in distribution curves of these variables, comparing to normal distribution.

Table 1: The Measures of Central Tendencies and Dispersion of Dependent Variables

Variable	Number	Lost	Mean	Std. Deviation	Varaince	Skewness	Kurtosis	Std. Deviation	
								Skewness	Kurtosis
Stock Return	378	189	45.8474	122.1975	14932.24	6.213	58.325	0.125	0.25
Return on Assets	378	189	11.2207	13.1175	172.069	0.33	1.467	0.125	0.25

The Independent Variables' Descriptive Statistics: Advertising expenditure and brand value are considered as the independent variables of this study. The information resulting from measures of central tendencies and dispersion of these variables are presented in Table 2. The information presented in this table indicates that the there is no significant deviation in distribution curves of these variables, comparing to normal distribution.

Table 2: Measures of Central Tendencies and Dispersion of Independent Variables

Variable	Number	Lost	Mean	Std. Deviation	Variance	Skewness	Kurtosis	Std. Deviation	
								Skewness	Kurtosis
Advertising Expenditure	378	189	33489.17	65197.32	4.25E+09	3.98	18.805	0.125	0.25
Brand Value	378	189	5.38E+11	1.38E+12	1.92E+24	5.902	41.636	0.125	0.25

Inferential Statistics

Reliability Test of Variables: This section deals with examination of stability and reliability of the variables. In order to examine the stability, we can use tests of Im, Pesaran and Shin [1997], Levin and Lin [1992], or some other well-known tests. The results of these two tests are presented in Table 3.

Table 3: Tests of Im-Pesaran-Shin [IPS] and Levin-Lin [LL]

Test		Im-Pesaran-Shin		Levin-Lin	
Symbol	Variable	Statistic	p-value	Statistic	p-value
SR	Stock Return	-9.29381	0	-14.7213	0
ROA	Return on Assets	-3.92978	0	-6.0856	0
AER	Advertising Expenditure	-4.88781	0	-6.54907	0
BV	Brand Value	-3.81918	0	-5.23522	0

According to the results [Table 3], since in both tests, p-value is less than 0.05, so the variables have been reliable in the research period. IPS test findings indicate that the variables mean and variance have been constant during the time, and variables covariance has also remained constant in different years. Therefore, using these variables doesn't lead to spurious regression.

Normality Test: The normality of variables distribution is a fundamental assumption of applying parametric tests. Of course the distribution doesn't need to be normal, and it can be explained in the case of large size of sample and no high skewness. In order to test distribution of variables in this study, we used the Kolmogorov-Smirnov test. The results of K-S Test using SPSS software, relating this variable is as Table 4. Considering this table and Z-statistics of Kolmogorov-Smirnov test, since significance level of all variables has been less than 0.05, the null hypothesis (H_0) is rejected, therefore the mentioned variables can't follow a normal distribution.

Table 4: Kolmogrov- Smirnov Test

Variable		Z Kolmogrov-Smirnov	Significance Level	Result
SR	Stock Return	4.739	0	Not normal distribution
ROA	Return on Assets	1.757	0	Not normal distribution
AER	Advertising Expenditures	5.716	0	Not normal distribution
BV	Brand Value	6.796	0	Not normal distribution

The Analysis of Nature of Variables and Test hypotheses: This study, using the correlation method and the regression analysis, based on postrior data study, has attempted to predict dependent variables through a set of explanatory variables, and its data has been presented as company-annual and a combination of cross-sectional and time series. Therefore the study used panel data regression method to examine the conceptual model. To use the analysis of panel data regression, a number of fundamental assumptions shall become justified. In accordance with this analysis, the model is selected in two forms of pooled or panel; in the case of approval of the panel model, one of these two forms of random effects or fixed effects model is fundamental, being specified through Limer and Hausmann Test. Other assumptions: they are normality of the distribution, linearity of relationship between explanatory and dependent variables, no linear relationship among explanatory variables, homogeneity of variance, the model residuals independence and the model residuals normality. No justification of these assumptions that might be large sample size, no extreme skewness and equality in the size of groups within sample can be explained. You can see the results of testing fundamental assumptions in the following.

The Model 1 to test hypothesis 1: Advertising budget and brand value are jointly and directly associated with return on assets [ROA].

$$ROA_{it} = B1_i + B2 AER_{it} + B3 BV_{it} + B4(AER_{it} * BV_{it})$$

AER is advertising expenditure; BV is brand value.

At the first step, the fitness of first model is performed in a, b, c and d sections, following essential hypotheses to select the best method.

The Examination of Independence of the Error Between the Actual and Predicted Values: In order to examine independence of the model errors, the Durbin-Watson test has been used. If the resulted values place 1.50-2.50, the model lacks of auto correlation. Considering the calculated value of this regression model is 0.831 and doesn't belong to the mentioned interval, therefore it is approved that there is a serial correlation of residuals in the first model. Therefore, there should be a first-order autoregressive variable [AR(1)], added to the first model as an added independent variable.

Heteroscedasticity: the values resulting from the White test [F-statistic] indicates that F-statistic at the error level of 0.05 is not significant; however it is significant at the error level of 0.01. Therefore the null hypothesis indicating lack of heteroscedasticity among data at the error level of 0.1 is totally rejected. For this reason, we had better use the GLS regression model.

Table 5: The Results of Heteroscedasticity of the First Model

Regression Model	White Statistic	P-value	Test Results
First	2.038323	0.0598	Heteroscedasticity

Collinearity Test of Independent Variables: Applying two factors of variance inflation [VIF] and variance tolerance among independent variables, is a way to identify whether a collinear relationship exists or not. According to data presented in [Table 5] the tolerance value of all independent variables is more than 0.4, VIF value is approximately 1 [much less than 4]; therefore the assumption of not existence of a collinear relationship is approved.

Table 6: Collinearity Test of Independent Variables

Symbol	Variables	Tolerance	VIF
AER	Advertising Expenditure	0.571	1.752
BV	Bran Value	0.611	1.636
AER*BV	Advertising Expenditure – Brand Value	0.412	2.429

Determining an Appropriate Model to Estimate the Regression Model: The regression Analysis using compositional series needs a set of preliminary tests including slopes of periods and sections and types of effects. In order to choose between pooled and panel models, the Limer test has been used. The Hausman test has also been used for determining types of effects. The Limer test helped to examine slope of company and periods, and in the case of significance the panel model was used. Then in the case of significance in random effects test, the fixed effects test has been applied. On the basis of significance level, Chow test results indicate that the hypothesis [of the integrated model] is not confirmed. In other words, there are individual and team groups effects, and in order to estimate regression model of the study, the panel data method should be applied. Therefore to determine the type of panel model [using random and fixed effects], the Hausman test is applied. Realizing the y-intercept is not the same for different years, it is necessary to determine a method using in estimating the model [random or fixed effects]. For this purpose we have used the Hausman test. This test examines the null hypothesis indicating compatibility of random effects estimation against the alternative hypothesis. The results related to Hausman test of model 1 are presented in [Table 6-4]. According to the results, the test is significant at confidence level of %99, indicating alternative hypothesis confirmation; therefore on the basis of the Hausman test, fitness of the first regression model using the panel data model by the method of fixed effects can be appropriate.

Table7: Results of Tests for Selecting a Proper Model for Applying Pooled or Panel Model and Types of Variables Effects in Model 1

Purpose & Test	Chow Test			Hausmann Test		
	f-statistic	Error Level	Result	Chi-square statistic	Error Level	Result
Section Test	5.734980	0.000	Significant Effects	27.176782	0.000	Fixed Effects

Now since the best method of examining the first model has been proved to use an additional first order autoregressive independent variable, with the help of the fixed effects model and GIS, the examination of its fitness is shown in Table 8.

The f-statistic value [27.68754] suggests significance of the whole regression model. As we can see at the bottom of the table, the determination coefficient and the adjusted determination value of the model are %72 and %69, respectively. Therefore, we can conclude in the mentioned regression equation, almost %69 of changes in return on assets are jointly and directly explained by the independent variables of advertising expenditures and brand value. In this table, the positive [negative] numbers in the coefficient value column indicate direct [indirect] effects of each variable on company's ROA.

Table 8: Results of the First Regression Equation's Fitness

Variable	Variable Coefficient Value in First Model	t-statistic	Level of Significance	Result	Relationship Direction
C	7.595714	6.173998	0	Confirmed	+
AER	-2.81E-05	-2.45104	0.0148	Confirmed	-
BV	1.31E-12	2.050963	0.0411	Confirmed	+
AER*BV	4.02E-18	2.349399	0.0194	Confirmed	+
AR[1]	0.6766379	13.25505	0	Confirmed	+
Coefficient of Determination	Adjusted Coefficient of Determination	f-statistic	Total Level of Significance		
0.721891	0.695818	27.68754	0		

According to Table 8, the significance level [sig] of advertising expenditure variable [AER] [0.0148] is less than the considered significance level in this study [%5]. The absolute value of t-statistic related to this variable [2.451] is more than the calculated t-statistic presented in the table with same degree of freedom. Return on investment reduces by 28 units, per 10000 units increase in advertising expenditure.

The significance level [sig] of brand value variable [BV] [0.0411] is less than the considered significance level in this study [%5]. The absolute value of t-statistic related to this variable [2.051] is more than the calculated t-statistic presented in the table with same degree of freedom. Return on investment increases by 13 units, per 10000000000 units increase in advertising expenditure.

The significance level [sig] of advertising expenditure-brand value variable [AER*BV] [0.0194] is less than the considered significance level in this study [%5]. The absolute value of t-statistic related to this variable [2.349] is more than the calculated t-statistic presented in the table with same degree of freedom. Return on investment increases by 4 units, per 10000000000000000 units increase in advertising expenditure.

Therefore, H₀ has been rejected at the confidence level of %95, and H₁ indicating "advertising budget and brand value have a joint and direct relationship with ROA" has been confirmed. Therefore, the first hypothesis stating "advertising budget and brand value [independent] are jointly, directly and significantly correlated with ROA [dependent]" has been confirmed.

The Second Model for Testing Hypothesis 2: advertising budget and brand value has a direct and joint association with stock return.

This hypothesis is examined by the following model.

$$SR_{it} = B1_i + B2 AER_{it} + B3 BV_{it} + [AER_{it} * BV_{it}]$$

SR is Stock Return; AER is Advertising Expenditure; BV is Brand Value.

In the beginning, fitness of second model is performed in a, b, c and d sections, following essential hypotheses to select the best method.

Independence of Errors Between Real Values and Predicted Values: In order to examine independence of the model errors, the Durbin-Watson test was used. On the basis of this test, if values place 1.50 to 2.50, the model lacks autocorrelation. According to the value resulted from the test of this regression model [1.936572], it is in the mentioned interval, therefore residuals serial correlation of the second model is not confirmed.

Heteroscedasticity: Similar two model 1, in order to estimate the heteroscedasticity, the White test was applied. The values resulting from the test [F-statistic] indicates that F-statistic at the error level of 0.05 is significant. Therefore the null hypothesis indicating lack of heteroscedasticity among data at the error level of 0.05 is totally rejected. For this reason, we had better use the GLS regression model.

Table 9: The Results of Heteroscedasticity of the Second Model

Regression Model	White Statistic	P-value	Results
2nd	8.025432	0.0199	Heteroscedasticity

Collinearity Test of Independent Variables: According to data presented in Table 9 the tolerance value of all independent variables is more than 0.4, the variance inflation factor [VIF] is approximately 1 [much less than 4]; therefore the assumption of not existence of a collinear relationship is approved.

Table 10: Collinearity Test of Independent Variables in the Second Model

Symbol	Variables	Tolerance	VIF
AER	Advertising Expenditure	0.571	1.752
BV	Bran Value	0.611	1.636
AER*BV	Advertising Expenditure – Brand Value	0.412	2.429

An Appropriate Model for Estimating the Regression Model: The regression analysis using compositional series needs a set of preliminary tests including slopes of periods and sections and types of effects. In order to choose between pooled and panel models, the Limer test has been used. The Hausman test has also been used for determining types of effects. The Limer test helped to examine slope of company and periods, and in the case of significance the panel model was used. Then in the case of significance in random effects test, the fixed effects model has been applied. On the basis of significance level, Chow test results indicates that the hypothesis [of the integrated model] is not confirmed. In other words, there are individual and team groups effects, and in order to estimate regression model of the study, the panel data method should be applied. Therefore to determine the type of panel model [using random and fixed effects], the Hausman test is applied. Realizing the y-intercept is not the same for different years, it is necessary to determine a method using in estimating the model [random or fixed effects]. For this purpose we have used the Hausman test. This test examines the null hypothesis indicating compatibility of random effects estimation against the alternative hypothesis. The results related to Hausman test of model 2 are presented in table 10-4. According to the results, the test is significant at confidence level of %99, indicating alternative hypothesis confirmation; therefore on the basis of the Hausman test, fitness of the first regression model using the panel data model by the method of fixed effects can be appropriate.

Table 11: Results of Tests for selecting a proper model for applying pooled or panel model and types of variables effects in model 2

Purpose & Test	Chow Test			Hausman Test		
	f-statistic	Error Level	Result	Chi-square statistic	Error Level	Result
Section Test	1.922230	0.0414	Significant Effects	21.463771	0.0001	Fixed Effects

Now since the best method of examining the second model has been proved to use the fixed effects model and GIS, the examination of its fitness is shown in Table 11.

The f-statistic value [2.229] suggests significance of the whole regression model. As we can see at the bottom of the table, the determination coefficient and the adjusted determination value of the model are %15 and %8.6, respectively. Therefore, we can conclude that in the mentioned regression equation, almost %9 of changes in stock return are jointly and directly explained by the independent variables of advertising expenditures and brand value.

Table 12: Results of the Second Regression Equation's Fitness

Variable	Variable Coefficient Value in second Model	t-statistic	Level of Significance	Result	Relationship Direction
C	38.0565	4.566851	0	Confirmed	+
AER	-9.99E-05	-0.648015	0.5174	Rejected	
BV	2.24E-11	2.922019	0.0037	Confirmed	+
AER*BV	-1.74E-17	-0.75648	0.4499	Rejected	

Coefficient of Determination	Adjusted Coefficient of Determination	f-statistic	Total Level of Significance
0.156592	0.086308	2.227994	0.000399

Data Description and Sample Characteristic: According to Table 12, significance level [sig] of advertising expenditure variable [AER] [0.517] is more than the considered level of significance of the present study [%5), the absolute value of t-statistic related to this variable [0.648] is also less than the calculated t-statistic value presented in the table with the same degree of freedom. Therefore we can conclude, advertising expenditure does not affect stock return.

The significance level [sig] of brand value [BV] [0.0037] is less than the considered level of significance in the present study [%5), the absolute value of t-statistic related to this variable [2.922] is also more than the calculated t-statistic value presented in the table with the same degree of freedom. Therefore, Stock return increases by 22 units, per 10000000000 units increase in brand value.

The significance level [sig] of advertising expenditure-brand value [AER*BV] [0.4499] is more than the considered level of significance in the present study [%5), the absolute value of t-statistic related to this variable [0.756] is also less than the calculated t-statistic value presented in the table with the same degree of freedom. So, advertising expenditure-brand value can't affect stock return.

Therefore, the null hypothesis is confirmed at the confidence level of %95, and the alternative hypothesis [H1], indicating that advertising budget and brand value are jointly and directly related to stock return is not confirmed. Therefore, Hypothesis 2, indicating that "Advertising budget and brand value [independent values] are jointly and directly correlated with stock return [dependant value]" has not been confirmed.

CONCLUSIONS

In this paper, on the basis of the literature review, we considered the joint effect of brand value and advertising expenditure on stock return. The first hypothesis, in accordance with available literature, has assumed brand value and advertising value are jointly affecting return on assets [ROA]. The results revealed that this hypothesis is confirmed. Regarding the results of testing H1, we can realize that costs spented for advertising and creating brand value [marketing costs] have a positive and significant relationship with ROA, which can be an acceptable reason for justifying costs spented in marketing, and the effects of these costs on company's financial performance can be demonstrated. The Hypothesis 2 considered the joint effect of brand value and advertising expenditure on stock return. The results didn't confirm this hypothesis. However more studies suggested brand value has a positive effect on stock return, but the effect of advertising expenditure was not confirmed, and totally the joint effect of advertising expenditure and brand value on stock return was not confirmed. Generally we can conclude company's brand value has a direct and significant relationship with ROA and stock return, which indicates that the concepts of brand value need to be a special consideration. For testing these two hypothesis a proper method of evaluation was essential. Previous studies had discussed various methods for evaluating company's brand. The problem with these methods was their complexity, hard measurement of many subjective factors and also that they were considering only one dimension of a corporation's activity. This research has applied a model proposed by Ruenroom and pattaratanakun [2012][15] for evaluating company's brand, which almost resolved former problems.

CONFLICT OF INTEREST

There is no conflict of interest.

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REFERENCES

- [1] Aaker D. [1991]. Managing brand equity. New York: Free Press.
- [2] Herremans I, Ryans Jr., J., & Aggarwal, R. [2000]. Linking advertising and brand. Business Horizons, [May-June]: 19-26.
- [3] Natalei Mizik, Robert Jacobson.[2008]. Valuing Branded Business, American Marketing Association, 73: 137-153
- [4] Azizi Sh, Darvishi Z, Namamian F, [2011]"Studying determinants of brand value in the companies listed on Tehran Stock Exchange, using financial approach", journal of Business Administration Outlook, N.6, PP 9-32.
- [5] Roland T.Rust, Tim Ambler et al.[2004]. Measuring Marketing Productivity: Current Knowledge and Future Directions. Journal of Marketing, vol. 68, pp. 76-89
- [6] Eng L., Keh H. [2007]. The Effects of Advertising and Brand Value on Future Operating and Market Performance. Journal of Advertising, 36(4): 91-100.

- [7] Kotler, P. [1991]. Marketing Management: Analysis, Planning and Control, 8th Edition, Englewood Cliffs, New Jersey, Prentice Hall. 33
- [8] Keller KL. [2005]. Building, Measuring, and Managing Brand equity, New Delhi: Prentice Hall of India.
- [9] Aaker DA. [1992]. Managing the Most Important Asset: Brand Equity. Planning Review , 20 [5], 56-58.
- [10] Aaker DA, Joachimsthaler [2006]. Brand Leadership. New York, NY: Free press.
- [11] Keller K. [1993]. Conceptualizing, Measuring, and Managing Customer-Based Brand Equity. Journal of Marketing, 57[January]: 1-22.
- [12] Attaran J, [2011], A review of source-based approach in competitive advantage", Journal of Tadbir[Plan], N.232.
- [13] Penrose, E. [1959]. The Theory of the Growth of the Firm. New York, NY John Wiley.
- [14] Charles Pahud DE Mortanges, Allard Van Riel.[2003]. Brand Equity and Sharholder Value.European Management Journal, Vol.21,pp.521-527.
- [15] Marie Dutordoir, Frank HM Verbeeten, Dominique De Beijer.[2014]. Stock Price Reactions to Brand Value Announcements:Magnitude and Moderators. Intrnet J. of Research in Marketing, 32: 34-47
- [16] Mattew T.Billet, Zhan Jiang, Lopo L.Rego.[2014]. Glamour brand and glamour stocks. Journal of Economic Behavior & Organization. Vol.107,pp. 744-759.
- [17] Belo, Frederico., Lin, Xiaoji. And Vitorino, Maria. [2013], available at <http://ssrn.com/abstract=1805124>
- [18] Ruenrom,Guntalee and Pattaratanakun,Suppakron,[2012],Corporate brand success valuation : an integrative approach to measuring corporate brands,International journal of business strategy , volume 12 , Number 3.
- [19] Kirk, C. P., Ray, I., Wilson, B., [2012], The impact of brand value on firm valuation: The moderating influence of firm type, Journal of Brand Management, Macmillan Publishers Ltd. 1350-231X Jour.
- [20] Robert A. Peterson & Jaeseok Jeong.[2010]. Exploring the impact of advertising and R&D expenditures on corporate brand value and firm-level financial performance, J. of the Acad. Sci. [2010] 38:677-690.
- [21] George C. Hozier, Jr., John D. Schatzberg. [2000]Advertising Agency Terminations and Reviews: Stock Returns and Firm Performance. Journal of Business Research, vol.50,pp.169-176.
- [22] Nikukar Gholam Hossein, Ekhlas Amir, Tolu'i Pedram, [2012], A mathematical model to determine brand equity and its implementation in a company", Year 4, N.11.
- [23] Khani Abdollah, Ebrahimi Khadijeh, 2014, "The effect of brand value on companies' sales revenue and market value", Journal of Modern Marketing, Year 4, N.2.
- [24] Ukiwe,Alladin,[2009],The joint impact of brand value and advertising on corporate financial performance and on stock return, Walden University.

ARTICLE

DESIGNING AND TESTING THE STRATEGIC ENTREPRENEURSHIP MODEL, USING MARKETING MIX ELEMENTS AND ITS ROLE IN SUSTAINABLE COMPETITIVE ADVANTAGE: (IRAN INSURANCE COMPANY OF ISFAHAN PROVINCE)

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ABSTRACT

In today's rapidly changing environment, firms and organizations should be distinctive from other competitors, in order to survive and grow, and to acquire new products, advanced technologies, modern organizational combination and market penetration. Strategic entrepreneurship is an emerging phenomenon and a factor affecting outputs of companies, and small, medium and large organizations, which is crucial for acquiring long-term sustainable competitive advantage in a wide range and a multilateral interaction of marketing mix factors. The present study is to have an applied investigation and test of strategic entrepreneurship model, by the use of marketing mix elements and the model's role in sustainable competitive advantage. In order to collect data, Delphi method as well as questionnaires has been used, and in order to refine the data, the structural model in the form of confirmatory factor analysis, path analysis and the software of LISREL have been applied. Three main hypotheses have been developed in this study, which are tested using confirmatory factor analysis and path analysis, and all three hypotheses are confirmed. The values of AGFI and GFI indicators are measured 0.91 and 0.95, respectively; and it is found out that competitive advantage factor is more important than other variables. The results indicate that firms create value and distinction for their companies, using the indicators, identifying and satisfying current and future needs of customers, recognizing competitors and their plans, and making necessary coordination between different parts of organization, and through this, create sustainable competitive advantage.

INTRODUCTION

In today's business environment, where the life-cycle of products and services are going to be shortened and future's benefits are uncertain, in order to achieve sustainable competitive advantage and create more profits, firms and organizations need to be increasingly clever and adaptable. In order to surpass each other, they are looking for the methods to correctly predict market changes, and provide the best values for their firms [1]. Meanwhile, entrepreneurship is particularly important, and researchers believe that entrepreneurial goals cannot be realized without a strategy for entrepreneurship, because the strategies determines arrangement of sources, processes, products and systems, which industries and companies adopt them to deal with the environment uncertainty (mistrust) [2].

Therefore, the connection between strategies and entrepreneurship, known as strategic entrepreneurship, is the success base of entrepreneurship in organizations; and performance improvement roots in adopting this kind of strategies prepared by the managers[3]. Strategic entrepreneurship is an emerging concept and a combination of entrepreneurship and strategic management science. Strategic entrepreneurial affects wealth creation, competitive advantage and performance; therefore it is an increasing necessity in today's competitive environment [4]. This study is going to present a scientific method for designing a strategic entrepreneurial model, using marketing mix approach and its role in sustainable competitive advantage of Iran Insurance Company in Isfahan province. Hence, designing this model, using marketing mix approach can have an important role in this regard. The paper has been designed in such a way, that primarily the literature of strategic entrepreneurship, marketing mix elements and sustainable marketing mix are investigated. Then, the conceptual model, which is derived from the hypotheses and questions of the research is described, and then, the research methodology is explained, and finally the conclusion is presented after analyzing the results of testing hypotheses.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Components of entrepreneurship

Organizational entrepreneurship is a process in which innovative processes or products are provided through induction and creation of an entrepreneurial culture in an already established organization. In

KEY WORDS
Entrepreneurship,
Strategic
Entrepreneurship,
Marketing Mix,
Sustainable Competitive
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other words, it is a set of activities that benefits from organizational support and resources, in order to achieve innovative results[5]. In accordance with the theories of Kanter [4], Hornsby (1993), Sepr (1990), Mervis and Kuratho (2001), and Fry (1993)[5], it is concluded that different steps of the organizational entrepreneurship process has been divided to three main steps; each of these steps also includes different sub-steps.

Strategic Entrepreneurship

It is defined as the activities are done by organizations in order to "continuously explore innovation-based opportunities" for gaining "profit or benefit", including new organizational combinations, new products, new processes, etc.), or in other words it can be defined as "developing competitive advantage through the continuous processes of innovation" [6].

The common thread between strategic and entrepreneurship management is known as helping organizations to gain competitive advantages and developing opportunities by the competitive advantages, in future. Strategic entrepreneurship is a set of organizational activities that improves the organization's ability to compete with other organizations of the industry, for achieving a better position [7]. The combination of entrepreneurship and strategic management as an important solution for financial growth and performance, has taken into consideration from deferent points of view in management literature. Perglman, on the basis of two concepts of diversity and ordering suggests that entrepreneurship activities develop diversity and strategy develops the essential ordering. In other words, they are two sides of the same coin. Recent researches have been studied on these two concepts. Hit, Ireland, Camp and Sexston[6]have reported the concept of strategic entrepreneurship as the intersection of entrepreneurship and strategic management.

Strategic entrepreneurship component

The present study uses some dimensions that were determined by Irelandand et. al. [6], because it is a comprehensive classification and many researchers has used it. Therefore, it worth to have a brief look at these five dimensionsas follows:

1. **Entrepreneurial Mindset:** it includes entrepreneurial opportunity recognition, entrepreneurial alertness, real options logic and entrepreneurial framework [8, 9].
2. **Entrepreneurial Culture:** it is a type of culture that appreciates and encourages new ideas, creativity and risk taking, tolerates failures, and promotes learning. It supports the process of innovation in products and its implementation, and considers the continuous changes with opportunities [10].
3. **Entrepreneurial Leadership:** Entrepreneurial leadership is the ability to influence others to have a strategic management of resources to focus on opportunity-seeking and advantage-seeking behavior [2]. Gupta et. al. (2004) have defined entrepreneurial leadership as attracting uncertainty, interest in change and innovation for gaining competitive advantage and aggressive competition with other companies [11].
4. **Strategic Management:** it is the art and science of development, implementation and evaluation of multifunctional task decisions that enables the organization to achieve its long-term goals and forms the basis for opportunity-seeking and advantage-seeking behaviors [12].
5. **The Use of Creativity and Development of Innovation:** they are crucial results of a entrepreneurial mindset, entrepreneurial culture and entrepreneurial leadership, and also includes strategic management of resources. They define the value of creativity and innovation in the opportunity-seeking and advantage-seeking behaviors [12].

❖ Marketing

In marketing, customers' satisfaction is the core of a company's activity, and all company's activity aims at satisfying customers' needs. Responding to the needs of customers through providing products and services that are compatible with the customers' desires can be an kind of achievement for companies[13].

A New Definition of Marketing: According to Philip Catler, marketing is "a human activity in order to satisfy needs and wants through the process of exchange". The origin and core unit of marketing system are human's needs and wants. Product is the result of human's need; anything provides a service or satisfies a need can be regarded as a product, such as people, places, organizations, services and opinions. Marketing is the seek for finding the most suitable market and the sectors in which organization can have more useful and more effective participation and responds to people's needs and wants. Marketing means dividing market into subsets, and determining the company's product for market orientation, including the skills of perceiving and satisfying the customers' needs and wants [14].

Marketing Mix Elements: The most important and the main part of marketing process are about marketing mix elements, which are known as controllable variables of marketing. Bumz and Bitner (1981) stated marketing mix elements as 7P, which is also known as service mix. They add three more factors (people, process and physical evidence) to McCarthy's four factor. Thus, here in this paper, we investigate these variables. The 7P's elements are as following[Fig. 1]:



Fig. 1: The 7P's elements

❖ Sustainable Competitive Advantage

Competitive advantage is the value provided by a company for customers, while this value is higher than the costs of customers [15]. Sustainable competitive advantage is firstly a long-term advantage and not temporary, and secondly it is not easily accessible by competitors. Generally we can describe the characteristics of sustainable competitive advantage as being durable, high defensive capability, good tolerance, forbearance capability, high viability, high supporting capability, high acceptability, justification and persuasion power, and significant ability of negotiation, that it has all or some of above mentioned characteristics in proper with its sustainability power and intensity[16].

The Research's Main Question and purpose

With regard to the important and crucial role of strategic entrepreneurship model and sustainable competitive advantage, this study is to help organizations, so that they can equipped themselves to be able to reacts properly to all important environmental changes, as well as help them to develop their competitive relative advantage. The main purpose of this study is investigation of the factors of strategic entrepreneurship, mix marketing and their roles in sustainable competitive advantage, so that a comprehensive model can be designed that enable all organizations and product and service providing companies to develop their competitive advantage through using strategic entrepreneurship and marketing to realize their organizational goals, and be prepared to play their effective service role in society.

The Research Hypotheses

The hypotheses of this research were developed based on the conceptual model which is composed of three main hypotheses. The main hypotheses of this study are as follows:

H1: There is a significant relationship between strategic entrepreneurship and sustainable competitive advantage.

H2: There is a significant relationship between strategic entrepreneurship and marketing mix.

H3: There is a significant relationship between marketing mix and sustainable competitive advantage.

The research's Conceptual Model

All research studies are based on a conceptual framework that identifies the variables of interest and their relationships [1]. This conceptual model which also is known as theoretical framework (Khaki, 1999, pp3), mental map and analytical instrument [17], is a pattern based on which, the researchers theorize about

the relationships among factors that are known important in creation of the problem. This hypothesis cannot be necessarily the words of the researcher and it might be reasonably resulted from previous studies on the problem, In other words, it is an instrument to refine the study's center [1]. Every survey and field study needs a mental map and a conceptual model that are designed in the form of an analytical instrument. Since the conceptual model or theoretical framework should be designed as a schematic diagram (analytical model), so that the number of variables and their relationships can be specified, the model of this study has been plotted as [Fig. 2].

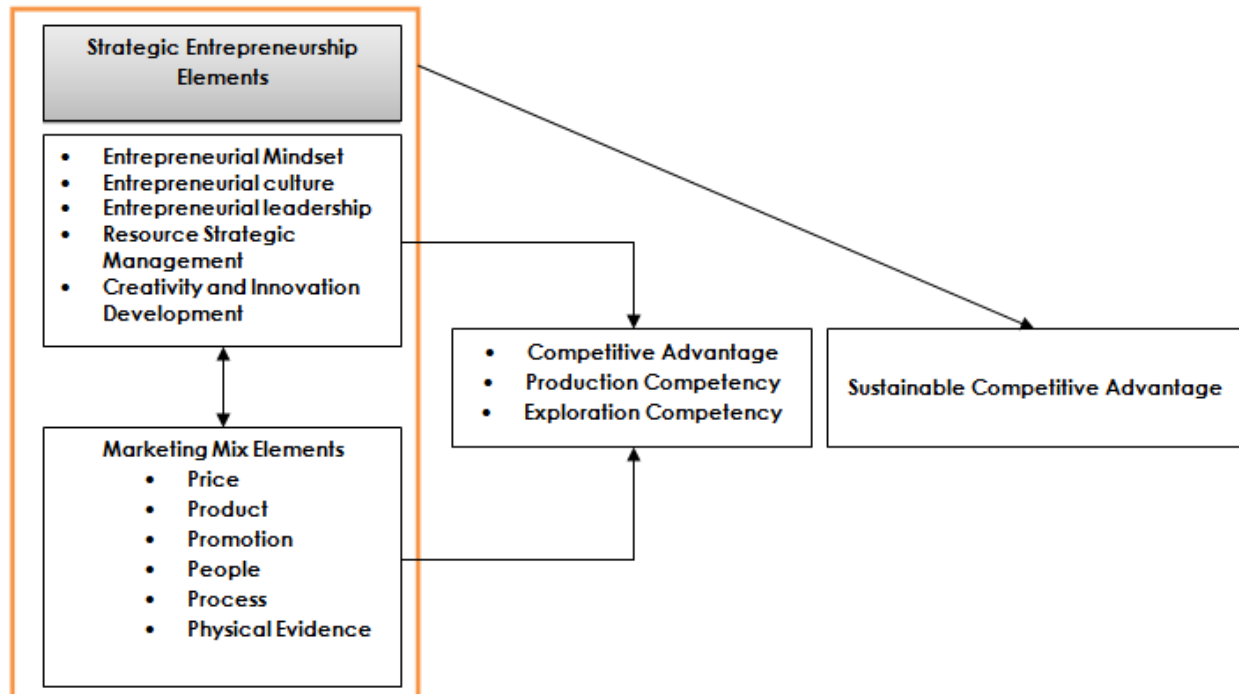


Fig. 2: Conceptual Model of the Research

METHOD

In order to design the strategic entrepreneurship model using the approach of marketing mix and studying its role in sustainable competitive advantage in Iran Insurance Company of Isfahan province, we have applied the descriptive survey method. In order to collect the required information for theoretical foundation of the research, we have used internet and library research methods, and Fuzzy Delphi method has been also used to examine the factors affecting strategic entrepreneurship and marketing mix: Firstly, the questionnaires were distributed to collect the comments of expert members of Iran Insurance Company (on the Likert format), then, results of the first questionnaire were revealed to them, so that the experts can be aware of primary results of each question and the general responses of individuals; the members were asked for identifying the important and crucial factors, which were missed in the first part. Then, the second series questionnaires were presented to the individuals. According to their views in the first phase and comparing them with the results of this phase, the following [Table 1] shows that the expert members have reached consensus in most of factors, and the differences have been very low and less than threshold value (0.1), hence, the survey regarding the above factors is stopped [Table 1].

Table 1: Defuzzification Mean Difference

	Defuzzification Mean of the 2 nd Phase	Defuzzification Mean of the 1 st Phase	Mean Difference
Product	0.91	0.85	0.06
Price	0.89	0.8	0.09
Place	0.88	0.77	0.11
Promotion	0.89	0.74	0.15
People	0.9	0.82	0.08
Process	0.88	0.84	0.04
Physical Evidence	0.91	0.81	0.10
Entrepreneurial Culture	0.92	0.9	0.02

Entrepreneurial Mindset	0.92	0.9	0.02
Entrepreneurial Leadership	0.93	0.9	0.03
Resource Strategic Management	0.89	0.61	0.28
Creativity and Innovation Development	0.93	0.91	0.02
Competitive Advantage	0.9	0.83	0.07
Production Competency	0.91	0.84	0.07
Exploration Competency	0.9	0.88	0.02

Research's Population and Sample: The population includes all persons and objects that have at least one common characteristic. A population with a limited number of members is called limited population [17]. Therefore, different organizational levels of Iran Insurance Company of Isfahan province including certification experts, department's managers, administrators, heads of branches, and a number of representatives have been identified to form the research's population, which includes 547 members.

Sample Size: To determine the sample size of a limited population, the following formula (Cochran's formula) has been used, where "n" represents sample number:

$$n = \frac{Z_{\frac{\alpha}{2}}^2 \frac{P(1-P)}{d^2}}{1 + \frac{1}{N} \left(Z_{\frac{\alpha}{2}}^2 \frac{P(1-P)}{d^2} - 1 \right)}$$

Where: N = Population size = 547 n = Sample size = 226

$$n = \frac{(1/96)^2 \frac{0/5(1-0/5)}{(0/1)^2}}{1 + \frac{1}{547} \left((1/96)^2 \frac{0/5(1-0/5)}{(0/1)^2} - 1 \right)} = 226$$

The number of sample is calculated as 226; therefore 226 questionnaires should be distributed. In order to know whether the questionnaire is valid or not, in addition to the views of experts, confirmatory factor analysis has been used. Also the internal consistency method has been applied for testing the data's reliability. The most important indicator of internal consistency is Cronbach's alpha test. The following formula calculates the value of alpha coefficient.

$$r_a = \frac{j}{j-1} \left(1 - \frac{\sum S_j^2}{S^2} \right)$$

Table 2: Measuring the Questionnaire's Validity through Cronbach's Alpha Equation

	Indicator	Cronbach's alpha	KMO
7P's Marketing Mix	Product	0.799	0.719
	Price	0.801	0.780
	Place	0.745	0.774
	Promotion	0.842	0.841
	People	0.760	0.793
	Process	0.881	0.863
	Physical Evidence	0.862	0.759
Strategic Entrepreneurship (INT)	Entrepreneurial Culture	0.851	0.830
	Entrepreneurial Mindset	0.879	0.888
	Entrepreneurial Leadership	0.760	0.769
	Resource Strategic Management	0.777	0.899
	Creativity and Innovation Development	0.849	0.800
Sustainable Competitive Advantage (COMP)	Competitive Advantage	0.791	0.744
	Production Competency	0.789	0.839
	Exploration Competency	0.819	0.866

In regard with the data presented in the above [Table 2], the value of KMO is 0.790 (more than 0.6), that indicates the questionnaire is valid, and since Cronbach's alpha of the questionnaire is higher than 0.7, Bartlett's test coefficient is also higher than 0.7, all selected indicators for measuring structures of the study are reliable and valid [Table 2].

Analysis: First, the Kolmogorov-Smirnov test was used to specify whether the components are normal or not. The parametric analysis on distribution of the measured variables in the research's population needs presumptions, including normal distribution of the variables. According to this assumption, any variable,

regardless of other variables, is normally distributed [Table 3]. First of all, we should formulate the following hypotheses for all variables of the research, before performing the above mentioned test:

H0: the data related to the component of is not significantly different from the normal distribution.

H1: the data related to the component of is significantly different from the normal distribution.

Table 3: Kolmogorov-Smirnov Test's Results of the Measured Indicators

Statistics Variables		ks	Sig	Result
Marketing Mix	Product	0.516	0.720	Assuming approval H1
	Price	0.390	0.998	Assumption Confirmation H1
	Place	0.550	0.922	Assumption Confirmation H1
	Promotion	0.585	0.883	Assumption Confirmation H1
	People	0.544	0.928	Assumption Confirmation H1
	Process	0.824	0.505	Assumption Confirmation H1
	Physical Evidence	0.655	0.784	Assumption Confirmation H1
Strategic Entrepreneurship (INT)	Entrepreneurial Culture	0.455	0.989	Assumption Confirmation H1
	Entrepreneurial Mindset	0.747	0.690	Assumption Confirmation H1
	Entrepreneurial Leadership	0.569	0.861	Assumption Confirmation H1
	Resource Strategic Management	0.533	0.934	Assumption Confirmation H1
	Creativity and Innovation Development	0.579	0.951	Assumption Confirmation H1
Sustainable Competitive Advantage (COMP)	Competitive Advantage	0.870	0.569	Assumption Confirmation H1
	Production Competency	0.641	0.718	Assumption Confirmation H1
	Exploration Competency	0.493	0.961	Assumption Confirmation H1

RESULTS

The Measurement Model or Confirmatory Factor Analysis (CFA)

The methodology of structural equation modeling initially needs the study of construct validity, so that it can be realized that the selected indicators are accurate and suitable for measuring structures. For this purpose, confirmatory factor analysis, has been used, that t-value of factor loadings of each indicator shall be more than 1.96; in this case, the indicator has the essential accuracy to measure its structure or latent characteristic. In this study, in order to investigate the attunement of the structures and their selected indicators, we have used the measurement model or confirmatory factor analysis for each studied dimension, which the results are as following [Table 4]:

Table 4: Structures' Effects and Significance of the Estimated Parameters of Second Order Factor analysis of Entrepreneurship, Marketing Mix and Competitive Advantage.

Components	Second-order structures	Standard estimates	t	Test result
Marketing Mix	Product	0.98	9.34	Effect Confirmation
	Price	0.79	7.91	Effect Confirmation
	Place	0.79	8.70	Effect Confirmation
	Promotion	0.71	10.11	Effect Confirmation
	People	0.66	9.09	Effect Confirmation
	Process	0.69	8.05	Effect Confirmation
	Physical Evidence	0.78	10.10	Effect Confirmation
Strategic Entrepreneurship (INT)	Entrepreneurial Culture	0.68	12.56	Effect Confirmation
	Entrepreneurial Mindset	0.79	10.76	Effect Confirmation

	Entrepreneurial Leadership	0.74	10.90	Effect Confirmation
	Resource Strategic Management	0.63	8.88	Effect Confirmation
	Creativity and Innovation Development	0.79	7.77	Effect Confirmation
	Competitive Advantage	0.68	6.99	Effect Confirmation
Sustainable Competitive Advantage (COMP)	Production Competency	0.58	8.19	Effect Confirmation
	Exploration Competency	0.64	11.34	Effect Confirmation

Structural Equation Modeling

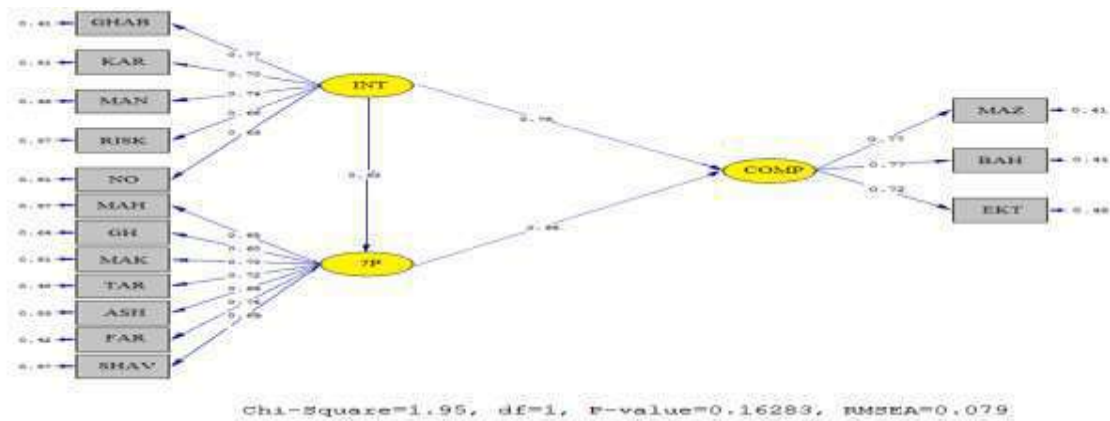


Fig. 3: The Relationships between Variables in Standard Condition

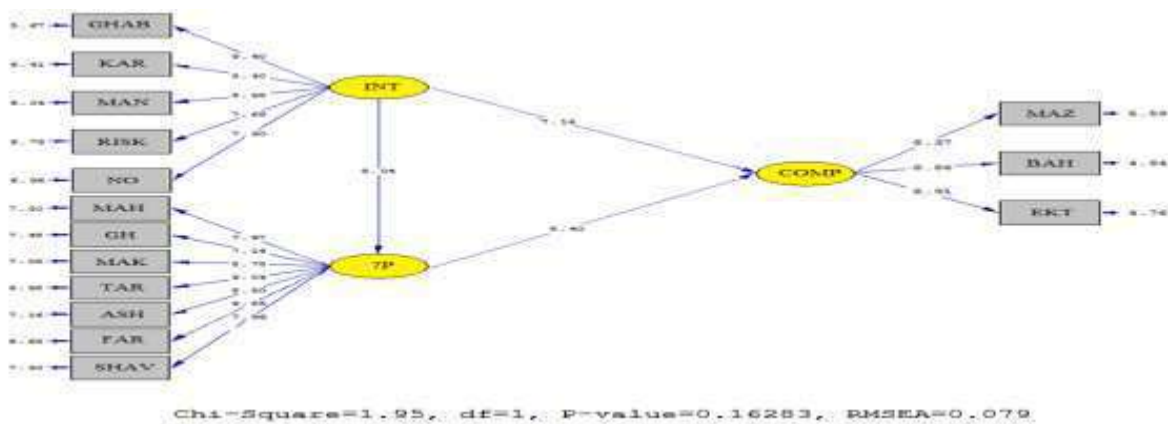


Fig. 4: The Relationships between Variables in Significance Condition

H1: There is a significant relationship between strategic entrepreneurship and marketing mix.

H2: There is a significant relationship between strategic entrepreneurship and sustainable competitive advantage.

H3: There is a significant relationship between marketing mix and sustainable competitive advantage.

Table 5: The Results of Standard Coefficients and Significance Tests (Hypotheses' Confirmation or Rejection)

Hypothesis	From	To	Standardized Coefficient	t-values (for significance testing)	Confirmed/rejected
H 1	Strategic Entrepreneurship	Sustainable Competitive Advantage	0.76	7.14	Confirmed
H 2	Strategic Entrepreneurship	Marketing Mix	0.63	9.04	Confirmed
H 3	Marketing Mix	Sustainable Competitive Advantage	0.66	8.40	Confirmed

According to [Table 5], all coefficients have the needed t-values (higher than 2) and all three hypotheses are confirmed.

Structural Model Fit (Path Analysis Model)

LISREL provides different indicators for model fit in text part. The number of these indicators of model fit is more than 68. These indicators help us judge the whole model and whether the model is acceptable or not; in other words, it helps to know whether our data approves the theoretical framework or not. The most common indicators, being reported in the majority of studies are presented in the following [Table 6]. If one of these indicators was not acceptable, we should not reject the whole model, but it is indicative of the model's relative weakness, which can be resulted from sampling, sample population, or other factors.

Table 6: Structural Equation's Measuring Goodness of Fit

Fit Index	Desired Level	Reported Value	Result
AGFI	higher than 0.8	0.91	Approved
IFI	higher than 0.9	0.97	Approved
NNFI	higher than 0.9	0.94	Approved
CFI	higher than 0.9	0.97	Approved
GFI	higher than 0.9	0.95	Approved
RMR	whatever smaller and closer to zero	0.099	Approved
RMSEA	less than 0.1	0.079	Approved
X2/df	less than 3	1.95	Approved

1. According to the [Table 6], the RMSEA value is 0.079, indicating the model is very suitable and the data fits the factor structure and theoretical basis appropriately, and this proves the validity of the structural model. Therefore, the test of hypotheses is properly accurate.

2. The values of AGFI and GFI are 0.91 and 0.95, respectively. Regarding goodness of fit index and adjusted goodness of fit index, The research's model is in a good condition.

CONCLUSION

The results from data analysis indicates that all hypotheses are approved, and there are significant relationships between dependant and independent variables. Path coefficient and t-value for the first hypothesis are 0.76 and 7.14, for the second hypothesis are 0.63 and 9.04, and for the third hypothesis are 0.66 and 8.04. In other words, we can conclude the following associations at the confidence level of %99:

1. There is a significant relationship between strategic entrepreneurship and sustainable competitive advantage.
2. There is a significant relationship between strategic entrepreneurship and marketing mix.
3. There is a significant relationship between marketing mix and sustainable competitive advantage.

Recommendation on the Basis of Research's Findings: According to the results field studies and tests conducted on the collected data, we can present some recommendations to improve and develop competitive advantage and the studied organizations of the population on the basis of strategic entrepreneurship and market orientation: With regard to the direct and indirect factors affecting the competitive advantage, it can recommend that the studied companies should give priority to marketing activities, in order to keep the sustainable competitive advantage. Companies should use marketing mix within the organization to create common vision and believes in the members, and attempt to identify and satisfy the present and future needs of customers, find the best solutions, identify the strength points and present condition of the competitors, analyze and evaluate competitors' capability and their ability to satisfy the customers' needs, coordinate the goals with different departments and their participation in preparing plans and marketing strategies, as well as distribute the information and opinions of customers in different departments of the Company, in order to make value for the company and improve its performance in increasing profitability, organizational learning, innovation etc.

REFERENCES

- [1] Edwards and colleagues [(1379) survey: guide, translator: Saeid Mohammad Arabi and David Divine, the Cultural Research Bureau.
- [2] David O. if, [1386] Strategic Management Market, translation Safar zadeh, Ali Akbar cultural and Mehdi Khadem, publication and distribution of scanned books.
- [3] Hao ma, Justin Tan. [2006] Entrepreneurship orientation, journal of business venturing, volume 21, issue 5, pp 104- 725.
- [4] Kanter, R, (1988). The Change Masters: Innovation and Entrepreneurship in the American Corporation, New York: Simon & Schuster,
- [5] Narver, G, C and Slater, S, F (1990), The effect of market orientation on business profitability. Journal of marketing, no 54, PP 22-3.

- [6] Ireland RD., Hitt, MA, Camp SM, Sexton DL. [[2001] Integrating entrepreneurship and strategic management actions to create firm wealth. *Academy of Management Executive*, 15 (1),49-63.
- [7] Barney JB. [1991] Firm resources and sustained competitive. *Journal of Management*, (17):99 120.
- [8] Earthy G. [1378] with the approach of the dissertation research methods, scientific research center
- [9] Kuratho D, Hornsb J, Naffziger D. [2001]Implementing Entrepreneurial Thinking in Established Organization, John Wiley & Sons.
- [10] MA. [1383] sustainable competitive advantage, manage, Issue 140.
- [11] Day DL. [1992] Research linkages between entrepreneurship and strategic management. In D. L. Sexton and J.D. Kasarda (eds), *The State of the Art of Entrepreneurship*. Boston: PWS- Kent, 117.
- [12] Cultural Ali Akbar, Safarzadeh H. [1385] entrepreneurship theory concepts, models and applications, Tehran University.
- [13] Warren J Keegan. [1380] *Global Marketing Manager*, Abdul Hamid Ebrahimi, Publications, Office of Cultural preceding studies.
- [14] Venkatama S. [1997] The distinctive domain of entrepreneurship research. *Advances in entrepreneurship, firm emergence and growth*, (3): 119 38.
- [15] Shane S, Venkataman S. [2000] The promise of entrepreneurship as a field of research. *Academy of Management, Review*, (25) (1): 219
- [16] Ghasemi B. [1382] *Strategic Management*, Abtin publications.
- [17] MirzaeeAhrnjany H. [1380] *Applied preceding studies* (1), *Knowledge Management*, Issue 17.

ARTICLE

EXAMINING THE RELATIONSHIP BETWEEN COMPETITION STRUCTURE OF PRODUCT MARKET AND LEVEL OF DISCLOSURE IN IRANIAN COMPANIES (CASE STUDY: COMPANIES LISTED ON TEHRAN STOCK EXCHANGE)

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ABSTRACT

Pricing power of product market is an important factor affecting earnings management. There have been used the adjusted Lerner index, Hirschman-Hirschman index and measurement standard of optional abnormal accrual items according to Kaznic model (1999) to examine the effects of pricing power of product market, industry structure and earnings management respectively. The research is correlation type that examines the relationship between independent and dependent variables. Its population consists of 114 companies listed in Tehran Stock Exchange, which they were studied from 2006 to 2013. For statistical analysis, there have been used quantitative methods including multivariate regression analysis based on panel data. To analyze, there have also been used E-Views, Excel and Stata software. The results show a significant effect pricing power of product market on earnings management, but industry structure has no a significant effect on excess returns.

INTRODUCTION

Calculating net profit of an enterprise is affected by accounting methods and estimations. This provides an opportunity for managers to manage the reported accounting earnings using variety of techniques[1]. Earnings management is defined as process of the informed decision-making by considering to the accepted accounting principles, in order to achieve the desired profit level. According to Melford and Kamiski [2], earnings management is an informed and active manipulation in accounting results to change representing business situation of an economic unit. Scott[3] has defined earnings management as selecting accounting policies to achieve some specific objectives. According to Wilde et al.[4] earnings management refers to public intervention in process of determining earnings often in line with management purposes.

The conducted research by Rocha and Diori showed that the extent of earnings management is beyond manipulation of reporting procedures and even includes manipulating real activities such as increasing production and inventory levels to reduce the final price. Thus, the different ways to conduct earnings management in form of increasing profits can be defined as follows:

- Recognizing costs later (i. e showing partial views to select depreciation method), recognition revenue sooner;
- Showing partial views to classify some cost items as of the period as product's final cost; Some fixed and intangible assets.

This will transfer part of costs in of the current period to the next period. As an indicator representing market organizational characteristics, market structure includes a wide range of from competition to perfect monopoly. Product market competitiveness means that different companies compete to produce and sell goods, while their goods are not preferred to the other. In other words, competitiveness means that the a company has failed to adopt production methods for producing better quality goods or supplying its manufactured goods with lower prices than other competitors in the market. As a result, it has failed to take possession market share.

In other words, this research seeks to find answer to the following question: can pricing power of product market and industry structure affect earnings management of the listed companies in Tehran Stock Exchange?

The present research is important because previous studies on earnings management have mainly examined the impact of product market competition on earnings management using Q-Tobin and the Hirschman-Hirschman indices. However, there has not been conducted any study on the most important factor influencing earnings management, namely pricing power product market. There have been used the adjusted Lerner index, Hirschman-Hirschman index and measurement standard of optional abnormal accrual items according to Kaznic model to examine the effects of pricing power of product market, industry structure and earnings management respectively.

KEY WORDS

product market,
competition, industry
structure, pricing,
earnings management

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THE RESEARCH THEORETICAL PURPOSES

1. Understanding the effects of pricing power of product market and industry structure on earnings management;
2. More familiarity with the concept of pricing power of product market, industry structure and earnings management as well as their evaluation criteria.

THE RESEARCH PRACTICAL PURPOSES

1. Legislator systems such as Audit Organization and Stock Exchange can use the research results to set their policies and make decisions about what type of information should be emphasized, in order to protect public interests and take optimal decisions.
2. The research results can help users of financial statements in making decisions.
3. The research results can help corporate executives to make decisions on how to manage good profits to provide company's interests.

RESEARCH HISTORY AND LITERATURE

Jagannathan et al. [5] argued that product market competitiveness is a systematization mechanism for managers and prevents them from useless spending. Using theoretical and empirical analyses, Bgggs et al. [6] showed that competition has a direct pressure on management efforts. They measured agency costs by separating companies with the same ownership and management and large corporations with diverse ownership. In both cases, the results showed a significant negative relationship between the agency costs with competitiveness of market.

In a research titled "competition in product market and earnings management", Tinakar and Tou (2009) examined the relationship between earnings management with competition. Their research results showed that competition reduces profitability of companies and therefore, earnings management is a factor to distort economic performance by managers.

In a research titled "competition in product market, information and earnings management", Markarian and Santalo[7] examined the effects of competition in product market on management incentives for earnings management. Their research results suggest two interactions: first, the results showed that how to increase manipulating profit due to pay more awards to management in more competitive markets; second, their research results showed that if investors have enough information about actual sales and efficiency of company, then competition may reduce the incentives of earnings management.

In an article titled "examining earnings management in the listed companies on Tehran Stock Exchange", Nowraves et al. [8] examined earnings management from 1996 to 2003. Their findings show that large enterprises in Iran have taken necessary actions for earnings management and motivation of implementing earnings management is associated with increasing debt. Managers of these companies use accruals to lower tax of their corporate. Managers will be more interested on earnings management by increasing firm size [8].

In a research titled "the relationship between competitive structure of product market with return on equity", by applying Herfindal-Hirschman index, Lerner index and the adjusted Lerner index in 87 companies listed on Tehran Stock Exchange from 2002 to 2009, Namazi and Ebrahimi[9] concluded that there is a negative relationship between Herfindal-Hirschman with return on equity, but it is not significant. While, there is a significant negative relationship between Lerner index and the adjusted Lerner in with return on equity. The finding means that the more competition in industries, the more return on equity. In other words, companies in competitive industries achieve more efficiency that this is consistent with predicting hypotheses of creative destruction and barriers to entry.

In their research, Ghorbani et al. [10] examined the relationship between product market competition, board composition and quality of information disclosure of the listed companies on Tehran Stock Exchange. The results show that product market competition has a strategic effect and a U-shaped relationship with quality of information disclosure. However, on rule effects, the results show that the percent of non-executive board members has no significant relationship with disclosure quality and product market competition does also not improve and strengthen the relationship between both variables. Examining control variables indicates a positive and significant relationship with ROA; while there is a significant negative relationship between debt ratio and firm size with disclosure quality. However, there is a poor relationship between firm sizes with disclosure quality statistically.

Namazi and Rezaei [11] examined the effects of product market competition on companies' cash dividend policy. In this respect, there were studied 67 listed companies from 2004 to 2010. The research results showed a significant inverse relationship between product market competition with companies' cash dividend policy.

RESEARCH HYPOTHESIS

H₁: pricing power of market product of companies based on the adjusted Lerner index is effective on earnings management.

H₂: industry structure is effective on earnings management.

In the present research, earnings management of companies shows its dependent variable. Earnings management can be referred as one of criteria for financial decisions. Studies about earnings management are generally considered in accruals [12].

According to research question and objective, pricing power of product market and industry structure have been considered as independent variables. In this study, there have been used the adjusted Lerner index and Hirschman-Herfindahl index to examine the effects of pricing power of product market and industry structure respectively. In this research, investment opportunities, profitability and firm size were considered as control variables.

METHOD

The research method is correlation type that examines the relationship between independent and dependent variables. Its population consisted of companies listed on Tehran Stock Exchange.

In the present research, systematic elimination method has been used to determine statistical sample. Accordingly, those companies in the population with the following requirements were selected as statistical samples; others have been removed:

1. They should be accepted in Tehran Stock Exchange until ending March 2006 and their fiscal year has been ended to this date;
2. The companies should not change their fiscal year during the studied period;
3. The required information of the companies should be available from 2006 to 2013;
4. They should not be bank or financial institution or holding companies;
5. They should not have operation break more than six months.

Given the above-mentioned limitations, there were selected 144 companies as statistical sample. In the research, the required data was gathered from the audited financial statements of listed companies in Tehran Stock Exchange, board reports, databases, Internet websites such as Kodal, official website of the Stock Exchange and available software such as Tadbirpardaz and Rahavard Novin. In the research, there have been used quantitative methods of statistical analysis including multivariate regression analysis based on panel data. To analyze its analysis, there have also been used E-Views, Excel and Stata software. In the research, there has been collected the related data from 2006 to 2013. Its population consists of all companies listed on Tehran Stock Exchange.

MODELS TO TEST HYPOTHESES

In this study, among the existing methods of data analysis, we use panel/pool data method. This technique combines time series-cross section data that is now widely used by researchers. This method is used when items cannot be studied as time series-cross section data or when number of data is low. Time series-cross section data is mainly integrated and used because of increasing number of observations, raising degrees of freedom, reducing variance heterogeneity and reducing linearity between variables.

❖ TESTING THE RESEARCH HYPOTHESES IN POOL MODE

The following statistical procedure has been done to analyze and test hypotheses:

1. Providing descriptive statistics related to the research variables;
2. Conducting variables' reliability test using Leon, Lin and Choi method;
3. Examining the correlation between independent variables using Spearman correlation table;
4. Conducting F-Limer Test to examine POOLED or PANEL hypotheses;
5. Conducting variance heterogeneity and auto-correlation tests to verify auto-correlation of the research models;
6. Conducting EGLS test for final testing of the hypotheses.

❖ EXAMINING DESCRIPTIVE STATISTICS

Descriptive statistics create part of the conducted analysis by a researcher that Table 4.1 shows the statistics. As one of central parameters, the mean represents center of gravity of the society and. In other words, it expresses the fact that if the mean is considered instead of all observations in a society, it will not cause any change in total data of its population.

Standard deviation is a number that represents data dispersion around the mean value of the same data. Among the research variables, investment opportunities had the lowest dispersion with standard deviation of 0.0047; therefore, they are more focused and more accurate. Meanwhile, firm size was more dispersed with standard deviation of 5.15 and less accurate than the other variables.

Undoubtedly, judgment about normality or abnormality data is one of the most important applications of indicator of descriptive statistics. Normal or abnormal data distributions can be realized using the provided values for the variables' skewness and kurtosis, but Jarekbra test is a test that is more common for the present research. As seen in indicator 1, the significance level of variables is less than 5%. Therefore, in confidence level of 45%, it can be said that these variables are not normally distributed.

Table 1: Descriptive statistics for the research variables and results of Jarekbra test

Variable name	Earnings management	Industry structure	Pricing power of product market	Investment opportunity	Profitability	Firm size
Mean	0.0222	0.0171	0.1740	0.0732	0.1456	12.46
Middle	0.0132	0.0030	0.1635	0.0775	0.1241	12.345
Max	0.3544	0.2337	0.4646	0.1574	0.6757	14.722
Min	-0.3670	0.000	-3.6574	0.050703	-0.2440	6.3247
SD	0.1347	0.0245	0.2325	0.0047	0.1243	1.544
Skewness	0.3414	6.012	-3.7454	1.3210	0.3473	04167
Jarekbra statistics	1360.364	45102.44	45222.17	3463.414	253.5365	142.77
Probability	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Number of visits	1142	1142	1142	1142	1142	1142

❖ EXAMINING VARIABLES' STATIONARY

The research variables refer to mean constants, variables' variance over time and their covariance in different years. As a result, using these variables in the model does not cause spurious regression. For this purpose, there have been used unit root tests of Lin, Levin, Chow and Philips Peron. Results of the tests in indicator 2 show that probability F-statistic is less than 5% for all variables, so all variables of the research are placed in a stationary level during the studied period. Also, due to stationary of variables, there is no need to steady long-term stationary of the research variables.

Table 2: Examining the variables' stationary

Variable name	Lin, Levin, Chow		Philips Peron		Conclusion
	Statistic	Probability	Statistic	Probability	
Earnings management	-13.3331	0.0001	334.347	0.0001	Stationary
Industry structure	-4.00233	0.0001	423.430	0.0001	Stationary
Pricing power of market	-4.56301	0.0001	437.152	0.0001	Stationary
Investment opportunity	-20.1224	0.0001	774.706	0.0001	Stationary
Profitability	-22.0211	0.0001	717.320	0.0001	Stationary
Firm size	-15.6334	0.0001	660.353	0.0001	Stationary

❖ EXAMINING LINEARITY (CORRELATION) OF THE RESEARCH EXPLANATORY VARIABLES

After describing data statistically and examining reliability of the research variables, there was tested correlation between the research independent variables. Correlation analysis is a statistical tool to determine type and degree of relationship between a quantitative variable with another quantitative variable. In general, correlation coefficients are changed from -1 to +1 and the relationship between two variables can be positive or negative. The correlation coefficient is a symmetrical relationship. When correlation coefficient is close 1, interdependence of two variables is higher, and vice versa. Higher correlation coefficient between independent variables in a model distorts the regression results.

Table 3 shows correlation between the independent variables. The Pearson correlation test and Spearman correlation test are used to evaluate correlation between parametric and nonparametric variables respectively. In parametric statistics, variables have quantitative (continuous) measure and observations are followed by normal distribution; but in nonparametric statistics, most of variables have qualitative scale and as they cannot be measured precisely, they do not follow any statistical distribution. It is called

free statistics distribution. Given that all variables in this research follow abnormal distribution, as a result, Spearman correlation has been used to examine correlation between the independent variables. Table 6 shows that there is no strong correlation between independent variables; therefore, from this point of view, the designed models are desirable to test the hypotheses.

Table 3: Results of the correlation between variables using Spearman test

Variables	Accruals	Industry structure	The adjusted Lerner index	Investment opportunity	Profitability	Firm size
Accruals	1					
Industry structure	0.0037	1				
Market pricing power	0.0365	0.0610	1			
Investment opportunity	-0.0263	-0.2333	0.01024	1		
Profitability	0.372	0.1053	0.4357	-0.1244	1	
Firm size	0.0263	0.2334	-0.0103	-0.4444	0.1244	1

❖ F-LIMER TEST TO DETECT POOLED OR PANEL OF THE RESEARCH HYPOTHESES

F-Limmer test was used to distinguish the pooled and panel data model, which its results indicate panel model. Since model type should be determined from the fixed or random effects in panel patterns, the Hassman test was carried out that its results show selecting the fixed effects model. Results of both tests are shown in [Table 4].

Table 4: Results of F-test

Hypotheses	F-Limer test		Hassman test			Result
	Statistic probability	Statistic value	Method	Statistic probability	Statistic value	
H ₁	0.0001	24.4506	Panel	0.0001	2.1423	Rejecting random effects model
H ₂	0.0001	30.434	Panel	0.0001	2.143	Rejecting random effects model

❖ Heterogeneity Testing of the Research Hypotheses

Heterogeneity testing of variances is another classic hypothesis that must be studied before final test. For this purpose, we have used STATA program that H₁ indicates variance heterogeneity and necessity to use EGLS to estimate the model; while H₀ indicates rejecting heterogeneity and use OLS. The test results are shown in [Table 5]. As all hypotheses in the research have heterogeneity problem, so we will use EGLS method to estimate the model.

Table 5: Results of heterogeneity testing of variances

Variables	F	F-value	Test result
H ₁	665.34	0.0001	Heterogeneous
H ₂	652.54	0.0001	Heterogeneous

❖ Autocorrelation Test of the Research Hypotheses

Investigating the autocorrelation of the designed models is another process of data panel before final testing of the research hypotheses. H₀ in autocorrelation test indicates lack of autocorrelation. The World Rage Test in STATA was used to test hypothesis of lack of autocorrelation. As shown in Table 6, the test results show autocorrelation in all hypothesis of the study. There is used the fixed effects' model by considering to AR (1) and AR (2) parameters to test all hypotheses in the research in regression final model. After studying classic hypotheses, we look for final testing of the research hypotheses.

Table 6: Results of autocorrelation test of the research hypotheses

Variables	F	F-value	Test result
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H ₁	5.177	0.0243	Autocorrelation
H ₂	5.050	0.0261	Autocorrelation

❖ Final Testing of the Research Hypotheses

H₁: pricing power of market product of companies based on the adjusted Lerner index is effective on earnings management *H₀* model:

$$AAA_{it} = \beta_0 + \beta_1 LI_{it} + \beta_2 MKBV_{it} + \beta_3 PROF_{it} + \beta_4 SIZE_{it} + \varepsilon_{it}$$

The conducted panel data process for the hypothesis is summarized as follows:

1. All variables are stationary and there is no need to study their long-term stationary.
2. There is no strong correlation between the independent variables.
3. They are panel data and panel data model is the fixed effects model.
4. The designed model to test this hypothesis suffers from variance heterogeneity problem.
5. The designed model to test this hypothesis suffers from autocorrelation problem.

Therefore, the estimation generalized least squares method (EGLS) and the fixed effects model by considering AR (1) parameter can be used to test H₁.

The results of the F-statistic probability (0.0001) indicate that the model is significant in general and its autocorrelation problem has been resolved, given the Durbin-Watson statistic (4.141). In addition, results of the adjusted coefficient of determination show that during the research period, 2.062% of changes in the dependent variable have been influenced by the independent variables and control the test [Table 7].

The results show that the adjusted Lerner index based on regression coefficient (-0.056) and probability (0.0001) has a significant negative impact on earnings management. This means that if the adjusted Lerner index is changed, earnings management will be changed with coefficient of -0.056. In addition, there is a profitability control variable has a significant positive impact on earnings management, but this impact is significant negative for variables of firm size and investment opportunities.

Table 7: Results of testing H₁

Variables	Coefficients	Statistic value	Statistic probability
Market pricing power	-0.056	-4.010	0.0001
Investment opportunity	-5.324	-3.200	0.0014
Profitability	0.433	17.367	0.0001
Size	-0.035	-3.403	0.0007
Constant	0.333	3.202	0.0014
Coefficient of determination	0.265		
The adjusted coefficient of determination	0.262		
Durbin-Watson statistic	1.441		
F-statistic	1.441		
F-statistic probability	0.00001		

H₂: industry structure affects earnings management.

The hypothesis model:

$$AAA_{it} = \beta_0 + \beta_1 HHI_{it} + \beta_2 MKBV_{it} + \beta_3 PROF_{it} + \beta_4 SIZE_{it} + \varepsilon_{it}$$

The conducted panel data process for the hypothesis is summarized as follows:

1. All variables are stationary and there is no need to study their long-term stationary.
2. There is no strong correlation between the independent variables.
3. They are panel data and panel data model is the fixed effects model.
4. The designed model to test this hypothesis suffers from variance heterogeneity problem.
5. The designed model to test this hypothesis suffers from autocorrelation problem.

Therefore, the estimation generalized least squares method (EGLS) and the fixed effects model by considering AR (1) parameter can be used to test H₂.

The results of the F-statistic probability (0.0001) indicate that the model is significant in general and its autocorrelation problem has been resolved, given the Durbin-Watson statistic (4.13). In addition, results of the adjusted coefficient of determination show that during the research period, 2.044% of changes in the dependent variable have been influenced by the independent variables and control the test (Table 8).

The results show that Industry structure based on regression coefficient (-0.102) and probability (0.0051) has no significant impact on earnings management. Control variables of investment opportunity, profitability and firm size have significant impact on earnings management.

The results show that pricing power of product market has a significant effect on earnings management, but industry structure has no significant effect on returns excess.

Table 8. Results of testing H₂

Variables	Coefficients	Statistic value	Statistic probability
Market pricing power	-0.102	-0.657	0.510
Investment opportunity	-5.327	-2.722	0.0066
Profitability	0.347	17.474	0.0001
Size	-0.031	-2.301	0.0052
Constant	0.740	2.656	0.0030
Coefficient of determination	0.253		
The adjusted coefficient of determination	0.244		
Durbin-Watson statistic	1.43		
F-statistic	70.43		
F-statistic probability	0.00001		

CONCLUSIONS AND RECOMMENDATIONS

Today, earnings management has become one of challenging and attractive issues in accounting studies because investors consider earnings figure as one of important factors for decision-making. Research has shown that low fluctuation and earnings stability indicate the quality; accordingly, with more confidence, investors will invest on shares of those companies with more stable earnings trend. In this regard, earnings management can be considered as a way to arrange notification of favorable financial status of companies that is conducted by management intervention in process of determining earning [8].

❖ Suggestions for Future Research

It is suggested to pay more attention to the following issues, in order to better use the research results and help examining the effect of pricing power of product market and industry structure on earnings management in the future:

1. Examining the effect of economic conditions such as financial crisis on the relationship between pricing power of product market, industry structure and earnings management;
2. Examining and testing the relationship between pricing power of product market, industry structure and earnings management in loss companies compared with profitable ones;
3. The effect of factors affecting product pricing such as product value for consumer, cost considerations, firm excellent management and government on the relationship between pricing power of product market, industry structure and earnings management;
4. Examining and testing the relationship between pricing power of product market, industry structure and earnings management using time intervals and determining time intervals' incensement to improve predicting the model.

❖ The Research Limitations

1. In process of scientific research, especially humanities such as accounting, there are cases out of control of researcher that can affect research results potentially. The purpose of this research is to examine the effect of pricing power of product market and industry structure on earnings management. For this purpose, the researcher controlled some variables. Therefore, the research

results would be changed, if there were implementing other possible factors affecting pricing power of product market, industry structure and earnings management such as economic conditions.

2. Due to the limited population of firms listed in Tehran Stock Exchange that their fiscal year ended in March, the results should be generalized on other companies with caution.
3. Data was extracted from financial statements from 1956 to 1963 that accounting standards have experienced many changes in this period. As a result, the extracted numbers might not be matched.

REFERENCES

- [1] Beatty, A. Ke, B. and Petroni, K. (2002) Earnings Management to avoid Earnings declines across Publicly and Privately held banks. *The Accounting Review* 77:547-570.
- [2] Mlfvrd and Kamysky (1996) *donya-e- eqtesad.com/news/516264* The effect of short-term and long-term institutional investors on the capital market
- [3] J Scott, W. R. T. financial Accounting Theory, 2003, Third (2) edition (Canada: Perntice-Hall)
- [4] Wild, J. J., Bernstein, L. A. and Subramanyam, K. R. [2001] *Financial Statement Analysis*, 7ed. New York: McGraw-Hill Higher Education
- [5] Jagannathan, R. and Srinivasan, S. B. (1999), "Does product market competition reduce agency costs?" *North American Journal of Economics and Finance*, 10(2):387-400.
- [6] Baggs, J., De Bettignies, J. E. (2007) product market competition and agency costs. *Journal of Industrial Economics*, 55(2):289-323.
- [7] Markarian, G. and J. Santolo. (2010) "product Market Copetition, Information and Earnings Management" IE Business School Working Paper
- [8] raj Noravesh, investigate earnings management in firms listed in the Tehran Stock Exchange, *Journal of Humanities and Social Sciences*, Shiraz University in 2005, No. 43, p 1653
- [9] Mohammad Namazi, Shahla Ebrahimi; The relationship between product market competition structure and stock returns, *Journal: Empirical Research in Financial Accounting*; Spring 2012 - Issue 3 (19 pages - from 9 to 27)
- [10] Saeed Gorbani product market competition, the composition of the Board of Directors and Disclosure Quality: Evidence from Tehran Stock Exchange, *Journal of Accounting and Auditing*, Issue 19, Autumn 2013
- [11] Mohammad Namazi, Gholamreza rezaei, the effects of competition in the product market on the company's cash dividend policy and strategy, *financial management*, First Year, Winter, 2013, Issue 3
- [12] Shokrollah khajavi, Gholamreza R. [2013], the effects of earnings management on the dividend policy of listed companies in Tehran Stock Exchange quarterly financial accounting Year 4, Issue 14

ARTICLE

ETHICS IN ACCOUNTING AND AUDITING

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ABSTRACT

Ethics is a set of traits, characteristics, manners and inner temperaments in one's self, and the origin of human speech and behavior in a way that he/she does good or evil unconsciously and spontaneously. This profession is the basis of financial and monetary systems of countries and plays a key role in accountability and transparency in the field of economics. However, the high levels of embezzlements, frauds, bankruptcies that, from the viewpoint of the public, could not have been without the awareness or probably intervention of accountants and auditors has led to confusion and raised some issues in relation to truthfulness and integrity as the main indicators of ethics in this profession. The researcher in the present article attempts to integrate the individual and professional ethics of a person as an accountant in accounting and auditing professions in order to reflect a clearer perspective of this profession by relying on the salient features of professional behavior such as independence, integrity and protection of public interests. Since the foundation of a society is formed by its members, in the field of ethical issues in accounting and auditing professions, we should start with the main authorities of this profession namely accountants and auditors. Accordingly, we will be able to clarify professional ethics for all accountants and auditors as far as possible. Otherwise, there would not be any ethical profession.

INTRODUCTION

Managers and administrators of public and private organizations and enterprises are beneficiaries, entitled and interested group. This role is played by professional accountants in the form of different financial reports of different intuitions[1]. The results of the activities of the accountants that offer such services will be reliable when they have moral virtues such as integrity, realism and truthfulness in addition to knowledge, skill, experience and continuous education and when they offer their professional services through abiding by the rules of accepted behavior[2]. Accounting ethics or professional ethics in accounting is in the first place a field of applied ethics, a study of moral values and judgments which is applied in accounting and auditing. This is an example of professional ethics [3]. Accounting ethics was first introduced by Luca Pacioli. Since then, it developed by public sectors, professional organizations and independent companies. Ethics is taught in accounting courses at institutions of higher education and also in accounting and auditing firms [4].

Due to the wide range of accounting services and the recent collapse and bankruptcy of big companies, considering ethical standards in the accounting profession is accepted. This collapse and bankruptcy has been the result of extensive ignorance of the status of accounting profession. In order to combat criticism and prevent fraud in audits, different accounting organizations and governments have established some regulations and solutions to improve ethics in the accounting profession. Most countries have different laws in the implementation of accounting rules.

RESEARCH OBJECTIVES

1. Clarifying basic concepts of ethics and the need for compliance with them in the accounting and auditing professions
2. Describing some cases of moral charges that may be entered in accounting and auditing professions
3. Investigating the strategies for the prevention of likely charges
4. Reviewing the studies on the code of professional ethics in accounting and auditing

Research Methodology

The present study has been conducted by reading books, journals and relevant articles in this field and through their scientific/promotive investigation and analysis.

THE DEFINITION OF ETHICS

In his dictionary, Allameh Ali Akbar Dehkhoda has defined morality as a set of "temperaments" and ethics as "the knowledge of good and evil" and considers it as one of three parts philosophy or pragmatism meaning "the management of one's self or that of another one". Dr. Hassan Anvari in his dictionary defined ethics as "a set of accepted cultural habits and behaviors among people in a society" and then refers to "proper and acceptable behavior". The Companion Encyclopedia of Ethics describes ethics as "the analysis and evaluation of human behavior based on ethical principles" and adds that different theories on human conscience and his/her responsibility for his/her actions have been proposed during history and the followers of different philosophies have considered various factors such as religion, nature

KEY WORDS

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and experience as ethics. According to the Britannica Encyclopedia, the term “ethics” is also applied to the theories and systems of moral values[5]. In this encyclopedia, ethics is divided into three branches: theoretical ethics, normative ethics and applied ethics. Theoretical ethics or metaethics deals with issues related to the nature of concepts and moral judgments. Normative or prescriptive ethics provides some criteria for the way of living in which the good and bad, right and wrong, and the like are defined and the method of selection among them and the proper conduct according to certain rules are clarified.

ACCOUNTING ETHICS OR PROFESSIONAL ETHICS IN ACCOUNTING

Ethics, the code of professional behavior and professional behavior are obviously placed in the category of applied ethics and contain a value system based on which the good and bad, right and wrong behavior of owners of an occupation are defined and clarified (MahdaviKhou, M. 2010)[14]. The field of applied ethics is the study of moral values and judgment which is applied in accounting and auditing. Accounting ethics was first introduced by Luca Pacioli. Since then, it developed by public sectors, professional organizations and independent companies. Ethics is taught in accounting courses at institutions of higher education and also in accounting and auditing firms. Due to the wide range of accounting services and the recent collapse and bankruptcy of big companies, considering ethical standards in the accounting profession is accepted[6]. This collapse and bankruptcy has been the result of extensive ignorance of the status of accounting profession. In order to combat criticism and prevent fraud in audits, different accounting organizations and governments have established some regulations and solutions to improve ethics in the accounting profession [7].

THE IMPORTANCE OF ETHICS

The nature of the accountants and auditors' job require a high level of ethics. Shareholders, potential investors, and other users use the financial statements to make thoughtful decisions about investment. The knowledge of ethics can help accountants and auditors overcome ethical problems, it also helps them to make a correct choice, although it may not be to the benefit of the company.

PROFESSIONAL PRINCIPLES IN ACCOUNTING AND AUDITING

We should first understand the principles before dealing with the professional principles of accounting and auditing. Principles tell you how to behave in an environment, that is to say, they tell you what your behavior in the environment should be like, so how you should behave in a workplace[8,10].

This question is very important because, as a professional, whatever your daily responsibilities are, you have enough knowledge and power. People should be ensured that you have the ability to do it. Professional principles determine how professional behavior should be. They also help you to take the responsibility of your actions. As an accountant, ethical behavior in workplace should be important to you. We need the public trust in the accounting profession and this trust increases if you obey a set of rules.

Another goal is to help you reach a point where you can work in an environment based on ethical principles. This means that you not only act based on the professional principles of IIT, but you should also work according to the principles set by your employer. You might be in a condition in which no one else is. Ethical principles help you in a moral dilemma. For this reason, you should know that your behavior is your responsibility. So you need knowledge and self-confidence in order to be able to control such a situation. It is important to know how you should act when an unethical behavior occurs in a situation. The consequences of making a mistake especially in money laundering is very serious. Professional principles in accounting and financial affairs will help you with these issues in the workplace.

EDUCATION OF ETHICS

In the 1980s, universities started teaching and doing business in ethics. The courses related to this field have developed dramatically in recent decades. Teaching ethics to accountants can include role playing, lectures, case studies, guest lectures, as well as other media. Recent studies show that all accounting textbooks are somehow involved in morality. In 1993, the first United States center focusing on the study of ethics in the accounting profession was opened at the State University of New York at Binghamton. Since the beginning of 1999, several states in America have necessitated ethics classes before holding CPA exam [15]. In 1988, Stephen E. Loeb suggested that the education of accounting ethics have seven goals. To implement these goals, he noted that accounting ethics is teachable throughout the accounting curriculum or in a class related to this subject. Teaching it throughout the curriculum requires that all teachers have the knowledge regarding the issue (an issue that might require education).

THE ADVANTAGES OF ETHICS MANAGEMENT IN WORKPLACE

1. Considering professional ethics has led to significant improvement of the situation of some societies.
2. Ethics programs let the organizations hold onto its ethical performance in unsettled conditions.

3. Ethics programs cause the formation of a strong team work and increase efficiency. Ethics programs harmonize employees' behaviors with the values which are given priority by the organization's leaders. Organizations usually observe clear contradiction between the preferred values and the values that are reflected by the behavior of employees in the workplace. Considering and debating values continually increase team work spirit, honesty and openness in the workplace. Employees feel that there is a consistency between their values and desired values of the organization, therefore, they work with a high motivation and great performance.
4. Ethics programs cause the growth and development of employees.
5. Ethics programs ensure the legality of the organization's policy. They also prevent the criminal act and negligence.
6. Ethics programs contribute to the management of common values in quality management, strategic planning and management of diversity.
7. Ethics programs create a positive image of the organization in people.

ETHICS MANAGEMENT PROGRAMS

Organizations can manage ethics in the workplace by creating an ethics management program. One of the main purposes of ethics management programs is creating a balance between competing values. An ethics program is composed of values, policies and activities that affect the correctness of organizational behavior. Ethics programs include extensive educations and assessments. They are used as a guide at the time of ethical dilemmas. Rarely are two ethics programs exactly the same.

KEY ROLES AND RESPONSIBILITIES IN ETHICS MANAGEMENT

The head manager of an organization should be fully supportive of the program: If he/she is not fully supportive of the program, employees recognize that. This apparent hypocrisy may create such a distrust that the situation becomes worse than the time when there was no formal ethics program [11, 12].

The creation of a committee of ethics management: the task of this committee is the implementation and administration of the ethics management program, education of policies, ethical practices and resolving ethical dilemmas. The committee should be composed of high-ranking people of the organization. The employment of an ethics officer: ethics officers usually teach the moral issues, they guide the employees especially to resolve ethical dilemmas in the workplace.

The engagement of a special agent: the duty of special agents is to coordinate the development of policies and procedures in order to institutionalize ethical values in the workplace. They are responsible for solving ethical dilemmas directly by interpreting policies and procedures.

TWO EXTENSIVE FIELDS OF PROFESSIONAL ETHICS

1. Managerial malfeasances: in this area, illegal, unethical or questionable actions of managers, as well as motivation for such behaviors and ways of their eradication are discussed.
- 2 - Ethical problems: they include a variety of ethical problems and issues that managers are faced with every day such as conflicts of interest, improper use of resources and violation of contracts and agreements.

PROFESSIONAL ETHICAL STANDARDS IN ACCOUNTING AND AUDITING

Behavioral and ethical codes form the most important policy of any profession and include the main characteristics of any profession and relationships of colleagues with the society and each other. These codes in accounting profession are called "the code of professional conduct". The role, duty and responsibility of professional accountants towards the society, investors and other beneficiaries and entitled people require that they abide by the general principles of morality in all respects, and adhere to a systematic and coherent code of professional conduct in order to achieve the acceptance, credit and social respect which are the requirements of working in any profession. What follows is the continuation of such issues proposed by Mahmoud Hemat Fard and Kaveh Ghadeir. A summary is given here.

Development and diversity of economic activities in the country and efforts to privatize public companies and the operations of government's administration have resulted in the increasing number and scope of activities of public joint stock company and increasing the development of the capital markets during the past decade and have intensified the need to impose financial monitoring of production, commercial and service units in order to protect the public interest, the rights and interests of investors and other interested people and beneficiaries. Fulfilling this need entails the provision of reliable, relevant and comparable financial information by companies and various institutions and this provision requires the use of the services of professional accountants in the units and the use of independent professional accountants for reviewing the information and auditing financial statements. The role, duty and responsibility of professional accountants towards the society, investors and other beneficiaries and entitled people require that they abide by the general principles of morality in all respects, and adhere to a

systematic and coherent code of professional conduct in order to achieve the acceptance, credit and social respect which are the requirements of working in any profession.

GENERAL CONDITIONS OF PROFESSIONAL CONDUCT IN ACCOUNTING

In the code of professional behavior, the fundamental principles of ethics and professional conduct of accountants are expressed and a theoretical framework for compliance with these principles in practice is provided. All professional accountants have to abide by these principles except for the ones who are explicitly excluded. Different conditions in a job may cause breach of the fundamental principles. Describing all the conditions that could lead to violations of these principles is not possible. The theoretical framework enables professional accountants to identify, assess and avoid the factors that may lead to violation of the fundamental principles, rather than complying with certain rules. In considering the potential impact of any factor on the violation of the principles, professional accountants should take into account the quantitative and qualitative factors simultaneously and if they are not able to provide the safety requirements, they should refuse to carry out or continue that service or resign totally.

THE FUNDAMENTAL PRINCIPLES OF ETHICS AND PROFESSIONAL CONDUCT

Integrity: Integrity is one of the requirements in the career of a professional accountant and he/she must be honest in his/her professional relationships and transactions. The terms such as honesty, frankness and justice are the requirements of integrity. **Realism:** professional accountants should consider the facts they should not allow prejudice, bias, conflict of interest or influence of others have an impact on their professional judgment and profession. **Competence and professional caring:** As a qualified person, an accountant should have a series of relevant general knowledge and a deep understanding of the accounting process and the issue being investigated. Professional accountants should promote their professional knowledge and skills in the field of development, new methods, techniques and regulations at an acceptable level. **Secrecy:** a professional accountant should regard the information he/she obtains during the provision of professional services as confidential. Moreover, he/she should not disclose such information without the explicit permission of the employer, unless the legal or professional right or duty has permitted the disclosure of the information. **Professional etiquettes:** a professional accountant should behave with courtesy and respect towards others during performing his/her duty. He/she must also observe the laws and regulations, and refrain from actions that could discredit his/her profession.

INDEPENDENCE

Another fundamental principles of ethics and professional conduct is the independence of certified accountant or the principle of an independent accountant. Due to the factors of violations of the independence, accountants should seek the factors that thwart these causes and should increase safety. The most important factors effective in creating safety are as follows:

1. Safety factors determined by the profession, rules and regulations
2. The safety factors in the institutions being audited
3. Safety factors in auditing firms

SAFETY FACTORS SET BY THE PROFESSION, RULES AND REGULATIONS

- Education, training and enough experience needed to enter the profession, requirements related to continuous reeducation
- Established professional standards and the implementation of disciplinary measures
- The control of the quality of work done by other institutions
- The enacted laws and regulations on the independence of audit firms and independent or certified accountants
- The Necessary Safety Factors in the Unit under Audit
- The nomination of the auditor by the unit management or the approval of company under audit by another authority in the company
- The employees of the company or unit under audit that adopt management decisions should be competent and capable.
- Policies and procedures of the department or company under audit should put an emphasis on fair financial reporting.
- There should be a systematic method apart from auditing for the referral of professional services in company or the unit under audit.
- The governance structure of the company such as the audit committee should have the opportunity to monitor the performance and communications of the company or the institution under audit.

THE PROCESS OF DEVELOPING CODES OF ETHICS AND PROFESSIONAL CONDUCT OF ACCOUNTANTS AND AUDITORS

Introduction: the development and diversity of economic activities in the country and efforts to privatize public companies and the operations of government's administration have resulted in the increasing number and scope of activities of public stock companies and increasing the development of the capital markets during the past decade and they have intensified the need to impose financial monitoring of production, commercial and service units in order to protect the public interest, the rights and interests of investors and other interested people and beneficiaries.

Fulfilling this need entails the provision of reliable, relevant and comparable financial information by companies and various institutions and this provision requires the use of the services of professional accountants in the units and the use of independent professional accountants for reviewing the information and auditing financial statements. By legislating the law of the use of specialized and professional services of accountants in the year 2014 and the enactment of the relevant regulations and the statute of the community of certified accountants in the years 1995 and 2000, the community of certified accountants of Iran was established in 2001 by some members of experienced accountants. Afterwards, some new audit institutions were established and a number of new CPAs were selected in the years 2002 and 2003. In 2003, auditors and valid audit institutions of Stock Exchange were also selected, therefore, professional accounting in Iran began a new era of activity and development. The role, duty and responsibility of professional accountants towards the society of, investors and other beneficiaries and entitled group require that they abide by the general principles of morality in all respects, and adhere to a systematic and coherent code of professional conduct in order to achieve the acceptance, credit and social respect which are the requirements of working in any profession. In this paper, first, a few points on ethics and code of conduct in general are made. Next, a brief explanation of ethics and the code of professional conduct will be given. Then, the fundamental principles of the code of professional conduct of accountants are mentioned and later a few points that seem to be more appropriate in the current conditions will be made.

Applied ethics is in fact the continuation of normative ethics in which the use of theories of normative ethics in some moralities such as human rights, racial and sexual equality, justice and similar issues are discussed. Ethics, the code of professional behavior and professional behavior are obviously placed in the category of applied ethics and contain a value system based on which the good and bad, right and wrong behavior of owners of an occupation are defined and clarified. To illustrate this definition, two questions must be answered. The first question is that "what is meant by the profession" and the second question is that "who is called a professional accountant?" Regarding the first question, it should be noted that there is no single definition of profession agreed by all. However, the Committee of Professional Ethics of International Federation of Accountants enumerates the following characteristics of a profession in the code of conduct of professional accountants: thought-based expertise in a specific skill that is achieved through education, training and experience, the adherence of members to a code of conduct and their belief in a common value system that is enacted by source administrator of profession and the acceptance of duty and responsibility towards society in its entirety (Code.. Par.6). With regard to the second question, it must be said that a professional accountant is the one who works in the field of accounting and becomes a member of a professional accounting community by meeting the requirements.

The role of professional accountants in the economy of societies and the necessity of protecting public interest require that systematic regulations in the field of ethics and professional conduct of accountants be developed and implemented to attract and maintain the public trust towards this profession (Code.. 6991, Par.8). A look at the history of the development of codes of ethics for professional accountants in the world and in countries where the professional communities of accounting have a long history indicate that since many years ago a systematic code of conduct has been developed, revised with the passage of time, completed and put into operation by different professional communities and that effective measures are being taken in the field of the establishment of a single professional conduct system for all professional accountants at the national level.

At the international level, the International Federation of Accountants formed a committee called "Committee of Professional Ethics". This committee developed the code of conduct for professional accountants in 1996 in order to be used as a model and guideline by professional communities which are members of the Federation (Code.. 6991, Par.4). The International Federation considers these decided requirements in these guidelines as least important requirements which are necessary in achieving the common goal, namely, the credibility and acceptability of the professional communities of accounting and requires that the associated committees and professional communities comply with it. Nevertheless, it has authorized the development of more extensive conditions and requirements in terms of adherence to the principles of professional ethics in the code of professional conduct of national committees. In cases where the laws and regulations of a country establish some limitations in the implementation of some rules of professional conduct in the International Federation, the national associations are bound to observe the law, but they should consider the ultimate aim of establishing rules of conduct and obey other regulations (Proposed Code.3002, Par.5.1).

In order to promote the compliance with ethics and professional conduct in the country, comprehensive efforts and measures by the professional accounting communities, professional organizations and professional accountants in three levels of rule enactment, education and implementation and its warranty seem necessary to such an extent that codes of ethics and professional conduct prepared by the Audit Organization and the community of certified public accountants in Iran are the translation, adaptation and summary of the law enacted in 1996 by the Committee of Ethics and the conduct of Professional Accountants of the International Federation of Accountants do not refer to the revisions carried out in the years 1998 and 2001 in the aforementioned statute. According to the proceedings of this newly proposed law which is likely to be implemented from 2005, the investigation and development of the revised law of the code of professional conduct based on the new international law with the explicit declaration of the compliance with the forecasted requirements by International Federation of Accountants seems necessary.

Additionally, in the formulation of the new emendation, it is essential that specific issues and legal relations of the country be also taken into consideration, particularly because the legal investigation of stock firms and tax audit have been assigned to certified public accountants. The explanation of the effects of public violations and offenses in the breach of the code of professional conduct, the relationship between public ethics and professional ethics and the cases in which the breach of public ethics could cause a violation of professional competence are among the factors that should be included in the code of conduct and disciplinary rules. Professional accountants may also commit offenses like other people that might lead to their prosecution according to the relevant rules and regulations. In cases where crime or violation is approved, the accused' sentence is obviously issued by competent judicial authorities. Some offenses and violations have consequent penalty according to the law and the decree of competent court which can lead to deprivation of employment in certain jobs. But some offenses and violations do not have such consequent penalties.

Yet, the commission of certain crimes and offenses could violate the authentication conditions of certified accounting or cause serious damage to it and, as a result, necessitates an appropriate disciplinary punishment. According to the third article of the statute of qualification assessment of certified public accountants and according to their selection method approved on 22.5.1995, the violation or infringement upon some cases can disqualify certified public accountants including: Infamy, drug addiction, a record of actual criminal convictions, and financial and administrative records of professional misconduct. The clarification and illustration of these issues and ways of dealing with them in the disciplinary regulation of certified public accountants of Iran is necessary. Prosecution of offenses committed in the past: the symbol of the public interest from the perspective of auditors' responsibility is the protection of interests of shareholders of public joint stock company, especially the shareholders of firms listed in Stock Exchange. The history of the Tehran Stock Exchange in the past few years indicate that a number of companies listed in Stock Exchange have been removed from the list and a few have not actually continued their activity. Due to the fact that these companies have been audited in the years before the emergence of such condition, if the relevant auditors do not issue the necessary warning in their reports through disagreement, rejection or the impossibility of giving a comment regarding the financial statements of these companies, in order to earn the public trust, it seems necessary that:

A) the community of certified public accountants review the audit reports in the years relevant to the companies and prosecute the accused auditors if the violation is approved.

B) As a supervisor of securities, Stock Exchange Organization delete the name of accused auditors from the list of reliable stock exchange auditors, based on the results of the investigation of certified public accountants.

The necessity of education: the community of certified public accountants and other professional communities of accounting associated with audit institutions, CPAs and other members of professional accountants necessarily demand that regulations and codes of ethics and professional conduct be educated and implemented in auditing institutions.

The establishment of safety factors in audit institutions: one of the most important measures that prevent the violation of ethics and professional conduct is the establishment of safety and deterrent factors in audit institutions. The practical education of auditors in the field of ethics and professional behavior, the development of policies and appropriate methods of work etiquettes, the method of referral of audit works and advisory services, the method of preparing and signing the audit report, particularly the establishment of a monitoring and control system are some of the measures that each audit firm implement depending on its size and conditions.

CONCLUSION

The results of this study indicates the importance of the education of ethics and its positive impact on the ethical and individual behavior and accordingly on accounting and auditing professions. The continuous improvement of ethical behavior of employees of accounting and auditing profession and its consequence in organizations and companies in the form of an organized complex, relying on the individual, social and professional ethics in accounting and auditing as a code of professional conduct, as well as paying special

attention to the dominant cultures and ethical models in an environment which is the major factor in individual and organizational ethical decision making can form a fundamental basis of data from the accounting system in order to earn the public trust of the society particularly that of intra and extra-organizational users. Other studies conducted in this field have examined the individual and professional aspects separately whereas this study attempts to consider both factors stimulatingly and as each other's complement. Furthermore, it emphasizes the use of ethical models that create piety and individual and organizational motivation.

It is recommended that the necessary solutions for the development of simulations education of individual and professional ethics, the method of motivating the employees to abide by codes of professional conduct, the possible shortcomings in the codes of professional conduct be investigated in future studies.

CONFLICT OF INTEREST

There is no conflict of interest.

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REFERENCES

- [1] Abdul Rahman AR.[2003] Ethics in accoun IJUM Journal of Economics and Management 11(1): 2-8.
- [2] Ather SM. Ullah MH. [2009] Islamic Accounting Systems and Practices Accounting Systems: The Cost and Management, November- December, 1-16.
- [3] Caliyurt KT. [2007]Accounting Ethics Education in Turkish Public Universities, Social Responsibility Journal, 3(4): 74-80.
- [4] Carroll R. [2005] A model for ethical education in accounting, In Gowthorpe, C. and Blake J. (Eds.) "Ethical Issues In Accounting" (2nd ed.) Taylor & Francis e-Library, 149-164.
- [5] Emrullah AB. Hadimi M. [2001] Ethics of islam (3rd ed.). Turkey: Waqf Ikhlas Publication, 6-27.
- [6] Filipe J A. Alberto M. Ferreira M. et al.[2011] An ethical issue in anti-commons management aquaculture case in Portugal. International Journal of Academic Research 3(1):250-252.
- [7] Gowthorpe C. [2005]Ethical issues and the auditor. In Gowthorpe, C. and Blake J. (Eds.) "Ethical Issues In Accounting" (2nd ed.) .Taylor & Francis e-Library, 135-149.
- [8] Harahap, S.S. (2002) The disclosure of Islamic values annual report, the analysis of bank muamalat, Indonesian's annual report. Journal of Islamic Economics 3(1): 35-45.
- [9] Helps L. [1994] Should we teach ethics in accounting education? Management Accounting: Magazine for Chartered Management Accountants72 (6): 46.
- [10] Hameed S. [2000] The need for Islamic Accounting: Perception of Its Objectives and Characteristics by Malaysia Accountants and Academics. Ph.D. Thesis. University of Dundee.
- [11] Hanif, M. Muhammad Iqbal, A., (2010) Islamic Financing and Business Framework: A Survey, European Journal of Social Sciences, 15(4):475-489
- [12] Haniffa R. Hudaib, M. [2010] Islamic finance: from sacred intentions to secular goals? Journal of Islamic Accounting and Business Research, 1(2): 85-91.
- [13] IFAC. [2007] Code of ethics for professional accountants. USA: International Federation of Accountants. Retrieved 15/12/2007, from www.ifac.org.
- [14] Mahdavihou M. [2010] An investigation into the effect of applying ethics by accountants on preparing reliable financial information, MA Thesis, Islamic Azad University, Hamedan Branch, Iran, 70-110.
- [15] Samadi A. Mahdavihou R. [2009] Impact of managerial ethics on organizational commitment: case of employees of Hamedan tax affairs head.

ARTICLE

THE RELATIONSHIP BETWEEN ORGANIZATIONAL CULTURE AND KNOWLEDGE MANAGEMENT IN NURSING SYSTEM AT HOSPITALS OF IRAN SHAHR CITY

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ABSTRACT

The main advantage of today's organizations is knowledge. Knowledge is a powerful tool that is developing and changing day-to-day, and knowledge control and management requires supporting and improving the organizational culture. Thus, paving the way for implementation of Knowledge management systems in the sense that makes members of the organization ready to cooperate in the implementation of Knowledge management plans are extremely important. The present study is applied in purpose and cross-sectional in terms of administration. The target population included all nurses in hospitals affiliated to Medical University of Iranshahr, which were estimated 134 nurses. The sample size was determined using Cochran formula and simple random sampling as 110 nurses. Data were collected through survey using the standardized knowledge management scale by Perust et al. and Organizational Culture Scale by Daniel Denison; also, the reliability and validity of the two were confirmed. The results of testing the hypotheses showed a significance relationship between Organizational Culture and knowledge management. Also, the generalization of data was good and indicated the significance of all components of organizational culture (Participation culture, compatibility culture, adaptability culture, responsibility culture) with knowledge management. Promoting the dimensions of organizational culture to facilitate knowledge management cycle is recommended to managers and decision-makers of University of Medical Sciences and the hospitals.

INTRODUCTION

Today, knowledge is an integral part of the success of organizations. If the process of change and evolution of knowledge is closely assessed in contemporary society, the conclusion is drawn that the present postindustrial society is an information-based society where power-oriented technology is gradually replaced by knowledge oriented technologies. In today's dynamic and complex environment, it is essential for organizations that constantly employ the new knowledge in the form of: establishing credibility and use in their products and services. In this context, Peter Drucker says: "the secret of success in the 21st century is knowledge management." So the concept of knowledge management is more important than the knowledge itself, it seeks to explain and clarify the way individual and organizational information is transformed to Individual and group knowledge [1]. Understanding the real role of knowledge in organizations helps to find an answer to the question of why some organizations are always successful. Understanding what factors contribute to the survival of an organization and bring a lively existence for it, is closely related to the concept of knowledge and how it's used in the organization [2]. Thus, having the natural resources cannot be just as important as knowledge. Knowledge-based organization achieves capabilities that enable it to make a great strength of a little power. Knowledge management is a new effort of the century—known as the era of knowledge—to preserve, guide, and increase the knowledge investments of the organizations and points that investment in science is the best and most profitable way [3]. Knowledge management is the process of knowledge creation, knowledge acquisition, knowledge storage, knowledge dissemination, knowledge sharing and finally, the application of knowledge. An organization needs to identify, acquire and storage the knowledge it requires to be able to use it when needed. The purpose of knowledge management in the organization is its condition in terms of attention, collection, preservation and dissemination of its required knowledge [4]. Hence, knowledge management includes the processes of creating knowledge, crediting knowledge, shaping it, and distribution and scientific application of knowledge in the organization [5]. Knowledge management by creating the necessary processes to identify and capture data, the required information and knowledge about internal and external environment and transferring them into important decisions and actions of organizations and individuals has a big share in system feedback [6]. Furthermore, the organizational culture is one of the most important elements of any organization which is associated with feeling, thought, and work of personnel and any speech, opinion and behavior takes its direction [7]. Organizational culture is the dominant behavioral pattern between people in an organization that is formed based on values, beliefs, and habits of people and will be supported by the majority of people. It is influenced by factors such as monitoring, control, communication, participation, conflict, cooperation, respect for social values, etc [8].

Denison considers organizational culture as an application for determining the values, beliefs, assumptions and common practices in the organization that shapes and guides the attitude and behavior

KEY WORDS

Knowledge management, organizational culture, nurse

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of members in the organization [9]. According to Edgar Schein organizational culture is shaped in response to two challenges every organization faces: the stability and integrity of the outer and survival and the unity of inner. The stability and integrity of the outer refers to the organization's situation in the environment, how can that organization face environmental changes [10]. By reviewing, modifying and creating an organizational culture that is flexible and appropriate, the pattern of interaction between people in the organization can be gradually changed and knowledge management can be used as a competitive advantage [11].

So given that today the world's most important feature is change, organizations are forced to rely on members as their most important asset and encourage them to understand, comprehend and provide new ideas and knowledge and to practically use the ideas for the objectives of organization. This activity requires that organizational culture is educating and supports knowledge-based activities as an important constituent of organizational character and behavior of personnel.

Also in this century due to changes in health care systems, organizations have many challenges such as increased costs and financial pressures, increased customer awareness, competitive markets, improving the quality, and cost effectiveness of the services. These changes need to increase of knowledge and information sharing and knowledge management techniques. The most important obstacle of an effective implementation of knowledge management is lack of culture of sharing knowledge and lack of understanding the myriad benefits of knowledge management among employees. Research also shows that knowledge-based culture, that includes values and beliefs of members of the organization in relation to the concepts of information and knowledge is the most important factor in the success of knowledge management. So, officials in the fields of health care can benefit from knowledge management tools to transform hospitals to learning hospitals and take an effective step for obtaining the required capabilities for this type of organizations. In the present study, the researcher intends to investigate the organizational culture among nurses working at hospitals of Iranshahr city; and then assess its relationship with knowledge management. Since these hospitals seek major developments in their level, results can provide the grounds for implementation and improvement techniques of excellence and organizational promotion in the hospital and improving its function.

KNOWLEDGE MANAGEMENT

Theoretical definition: knowledge management refers to establishing the processes necessary to identify and capture data, information and knowledge that an organization needs from internal and external environment and transfer them into decisions and actions of organizations and individuals [11].

Operational definition: In this study, knowledge management refers to the situation of an organization in terms of collecting, preserving, and disseminating the knowledge it requires which are assessed using knowledge management building blocks model by Perust et al. Its components include the following [7]:

1. Set the goals of knowledge: The aims of knowledge management should be derived from the main goals of the organization.
2. Identify knowledge: Understanding the sources of knowledge within and outside the organization.
3. Acquire knowledge: knowledge must be acquired from the identified resources at this stage (domestic and foreign markets).
4. Development and improvement of knowledge: the ways which contribute to the richness and promoting knowledge in organizations; including its support for the research institutions, human resource development and employing knowledgeable people.
5. Dissemination of knowledge: transfer knowledge in the interaction and communication between people.
6. Use of knowledge: to actualize the acquired knowledge and implementing knowledge in the organization.
7. Maintenance of knowledge: to selected the knowledge in accordance with objectives and save them in a way that is accessible, and to update them.
8. Knowledge assessment: the possibility of measuring the level of knowledge that will promote knowledge

ORGANIZATIONAL CULTURE

Theoretical definition: a system of common understanding among the members of an organization; this feature makes distinction among two organizations [12]. Operational Definition: In this research, organizational culture refers to the dominant atmosphere of the studied organization that is measured using a questionnaire by Daniel Denison. Its components include involvement, consistency, adaptability and mission of the organization.

Involvement

This index refers to capability development, sense of ownership, and accountability in people.

Consistency

Theoretical definition: the values and systems that are the basis of a strong culture. Operational definition: those employees who respect to the values of the organization and follow strong and ideal organizational

culture have the power of consistency. In Denison questionnaire, the variables related to consistency include: core values, agreement, coordination and integration.

Adaptability

Theoretical definition: translating the demands of the business environment to operation. Operational definition: organizations have the ability of to adapt to their customer needs and service requirements, through the acquisition of new knowledge and change. In this study, the adaptability consists of three components of organizational learning, customer focus, and creating change in Denison Organizational Culture Survey.

Mission

Theoretical definition: a significant long-term direction for the organization [12] operational definition: the mission of any organization, in fact, is the primary cause of and the reason for its establishment. The mission of organization is the main and unique destination that distinguishes an organization in terms of type, scope of operations, product and market and the customers from other organizations. The mission (general objectives of organization) expresses the values, aspirations and philosophy of the organization. In this study, the mission is measured using Daniel Denison survey which includes the components of the vision, goals and objectives, strategic direction and intent.

THEORETICAL FRAMEWORK

Nonaka explains the difference of organizations by means of management mental elements, such as management vision, system of values and commitment of staff. This is despite the fact that many management thinkers have avoided addressing the human mentality. For example, Simon (1945) emphasized that the actual assumptions must be separated value assumptions so that management becomes a science. So, as Flyvbjerg (2001) states social sciences are essentially different from natural sciences based on the need to address the mental affairs such as values, background and strength. Hence social science research cannot be assumed independent of subjective factors [13]. So, knowledge management process rarely can be used as a causal normative model. Since knowledge is mentally active in nature and involves commitment and belief that are deeply rooted in the value system [14]. In a study by Shirvani et al. on the subject of the rule of knowledge management processes carried out at the University of Medical Sciences, results showed that identification, acquisition, development, sharing, distribution, use and storage of organizational knowledge and its application with modern management tools such as knowledge management, has empowered the organizations in competitive conditions, and provided the preliminaries for their success. In a study by Tabibi et al., the principles of knowledge management in hospitals of Iran University of Medical Sciences were examined and findings showed that attention to the spread of knowledge, assessment of knowledge, application of knowledge, knowledge sharing and creation of knowledge is necessary. In a study by Sadoughi et al. titled as process-driven organizational memory model, a prerequisite for the implementation of knowledge management in the medical documents department, results showed that workers will have better performance if required knowledge and information is provided. In this research, the collection of variables and entities required for an organizational activity-based storage system was introduced as a means of conducting Knowledge management in the medical records departments. Karami et al. studied the application of knowledge management in clinical coding in health care organizations. Results showed that identifying and use of knowledge management tools can improve organizational performance [15]. Ahmadi et al. compared the existing organizational culture in Isfahan University of Medical Sciences with the desirable condition. Their results showed that a significant difference existed between the current and desired elements of organizational culture. Therefore, institutional and policy reforms related to knowledge management was proposed. Also, in a study by Jafar Jalal et al., that investigated the correlation among nurses' perceptions of their organizational culture and their performance in patient safety in hospitals of Babol University of Medical Sciences. The findings showed that optimization of organizational culture by the managers and officials in hospitals can improve the performance of nurses in the field of patient safety. In another study by Ahmadian et al. titled as the organizational culture from the perspective of nurses in selected hospitals of Tehran University of Medical Sciences, findings showed that organizational culture from the perspective of nurses is at a level that may reduce their performance. Hence, optimizing organizational culture to increase nurses' incentives and to improve their performance in providing high quality services is necessary.

HYPOTHESIS

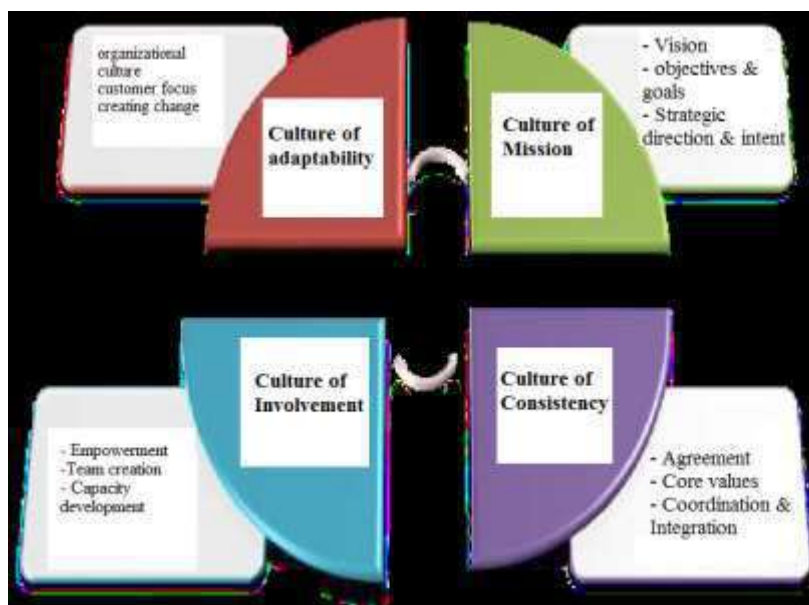
The main hypothesis

There is a relationship between organizational culture and knowledge management system in the hospitals of Iranshahr.

Secondary Hypotheses

1. There is a relationship between involvement and knowledge management among the nurses working in hospitals of Iranshahr.

2. There is a relationship between culture of consistency and knowledge management among the nurses working in hospitals of Iranshahr.
3. There is a relationship between culture of compatibility and knowledge management among the nurses working in hospitals of Iranshahr.
4. There is a relationship between culture of mission and knowledge management among the nurses working in hospitals of Iranshahr.



RESEARCH CONCEPTUAL MODEL: (RESEARCHER-BUILT)

This study is cross-sectional in administration and applied in purpose. The target population included all nurses of hospitals affiliated to University of Medical Sciences of Iranshahr (n=134). Sample size was determined using Cochran formula and simple random sampling as 110 individuals.

$$n = Nz^2 \frac{p(1-p)}{d^2}$$

$$p(1-p) = 0.25$$

(N= 136; number of nurses in different wards of hospitals), (n= 110, sample size), (P = 0.5)-(Z0.95 for level of sig. 95%- 1.96), (d precision, if the value is 5% the figure d=0.05 enters)

Data collection was done through survey method using a standard questionnaire with confirmed reliability and validity. To investigate KM the building blocks of knowledge management model of Proust et al., and for organizational culture Daniel Denison model is used.

Organizational Culture Survey: the questionnaire was developed by Denison in 2000. The number of questions in the questionnaire consisted of 60 questions in based on a 5 degrees Likert scale (from strongly disagree to strongly agree). Questions 1 to 15 refer to culture of involvement including: empowerment, team-building, developing capabilities; 16-30 refer to cultural compatibility component, including core values, agreement, coordination and integration, 31 to 45 refer to components of culture of adaptability, including: creating change, customer focus, organizational learning; and 46-60 refer to cultural mission component including: strategic direction, goals and objectives, vision [16]. Shirin has estimated the validity of the questionnaire in Iran as 82.5% Cronbach's alpha [17].

Cvr:0.82.5 The index of content validity ratio (the most important and most accurate content)

Cvi:0.84 The index of content validity (selecting tool items in the best possible way)

Table 1. Cronbach's alpha coefficient of components of organizational culture

	Involvement	Consistency and integration	Adaptability	Mission	Total
Cronbach's alpha	84%	74%	87%	85%	82.5%

Knowledge management questionnaire: This questionnaire contains 21 questions based on 5 degrees Likert scale, and measures 8 elements of Knowledge management. Questions 1 and 2 refer to set the goals of knowledge, question 3, 4, and 5 to identifying Knowledge, questions 6 and 7 to acquiring knowledge, questions 9,8 and 10 to knowledge development, questions 11 -14 to knowledge sharing, questions 15 and 16 to use of knowledge, questions 19,18,17 to maintenance of knowledge, and questions 20 and 21 to knowledge assessment. Galvani (2008) in their study calculated the reliability of the questionnaire through Cronbach's alpha as 94% [18]

Cvr:0.84 The index of content validity ratio (the most important and most accurate content)

Cvi:0.86 The index of content validity (selecting tool items in the best possible way)

For data analysis through correlation (regression analysis) SPSS software was used. First, demographic variables such as age, sex, education level, work experience, and employment type were reviewed in frequency tables and figures; and then the questions and hypotheses were examined to find the relationship between variables. In this research, organizational culture and knowledge management aspects were the independent variable and knowledge management was the dependent variable.

FINDINGS

There is a relationship between involvement culture and knowledge management among the nurses working in hospitals of Iranshahr. This hypothesis is tested using Spearman correlation at $\alpha=0.05$. The p value is less than alpha, so: the hypothesis of no correlation between culture of involvement and knowledge management among the nurses working in hospitals of Iranshar is rejected. The correlation coefficient was obtained for involvement culture and knowledge management as 0.445, i.e. a significant direct relationship exists between involvement culture and knowledge management among the nurses working in hospitals of Iranshahr. [Table 2]

Table 2: results of Spearman correlation test between culture of involvement and knowledge management among nurses of Iranshahr hospitals

Variable	Mean	Sd	r	p
Involvement culture	50.61	8.891	R= 0.0445	P= 0.000
Knowledge management	60.573	13.769		

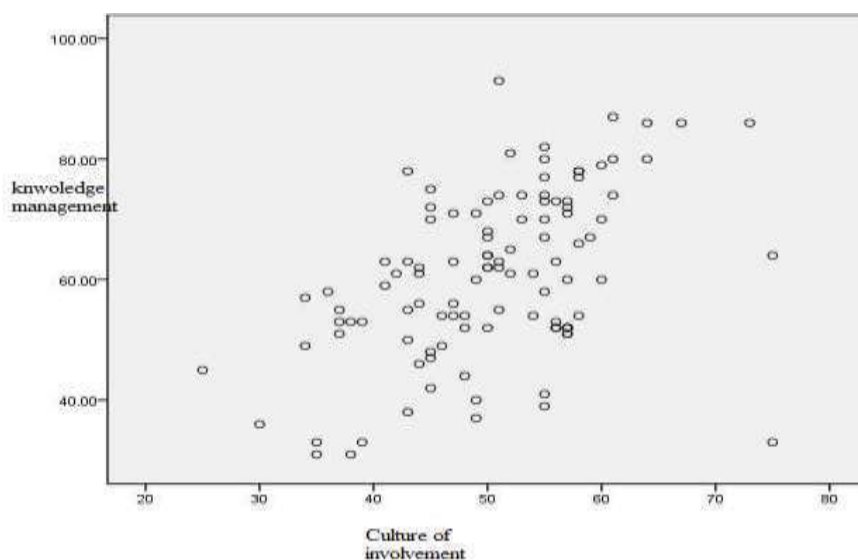


Fig. 1: The correlation Fig. between culture of involvement and KM

There is a relationship between culture of consistency and knowledge management among the nurses working in hospitals of Iranshahr. This hypothesis is tested using Spearman correlation at $\alpha=0.05$. The p value is less than alpha; so, the hypothesis that no correlation exists between culture of consistency and knowledge management among the nurses working in hospitals of Iranshar is rejected. The correlation coefficient was obtained for culture of consistency and knowledge management as 0.607, i.e. a significant direct relationship exists between culture of consistency and knowledge management among the nurses working in hospitals of Iranshahr. [Table 3]

Table 3: The results of Spearman correlation test between culture of consistency and KM among nurses of Iranshahr hospitals

Variable	Mean	Sd	r	p
culture of consistency	47.65	8.749	R= 0.607	P= 0.000
Knowledge management	60.573	13.769		

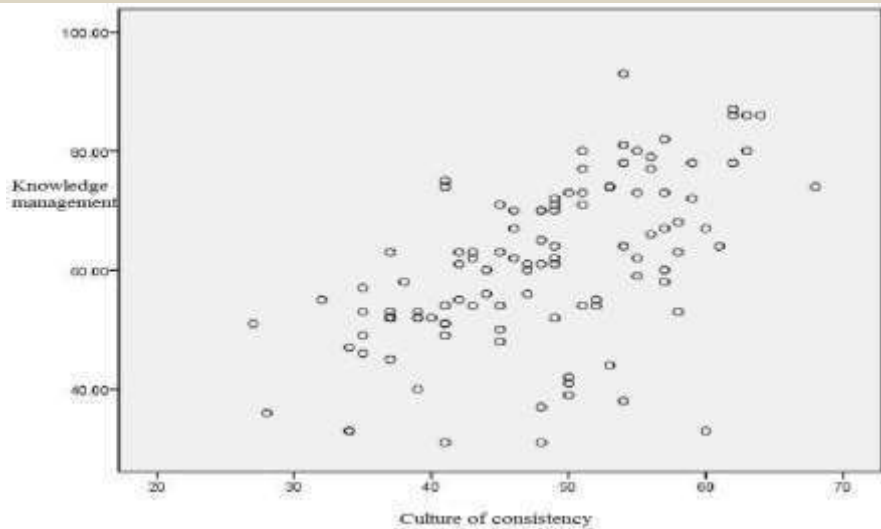


Fig. 2: The correlation Fig. between culture of consistency and KM

There is a relationship between culture of adaptability and knowledge management among the nurses working in hospitals of Iranshahr. This hypothesis is tested using Spearman correlation at $\alpha=0.05$. The p value is less than alpha, so: the hypothesis of no correlation between culture of adaptability and knowledge management among the nurses working in hospitals of Iranshar is rejected. The correlation coefficient was obtained for culture of adaptability and knowledge management as 0.492, i.e. a significant direct relationship exists between culture of adaptability and knowledge management among the nurses working in hospitals of Iranshahr. [Table 4]

Table 4: The results of Spearman correlation test between involvement culture and knowledge management among nurses of Iranshahr hospitals

Variable	Mean	Sd	r	p
culture of adaptability	49.87	9.632	R= 0.0492	P= 0.000
Knowledge management	60.573	13.769		

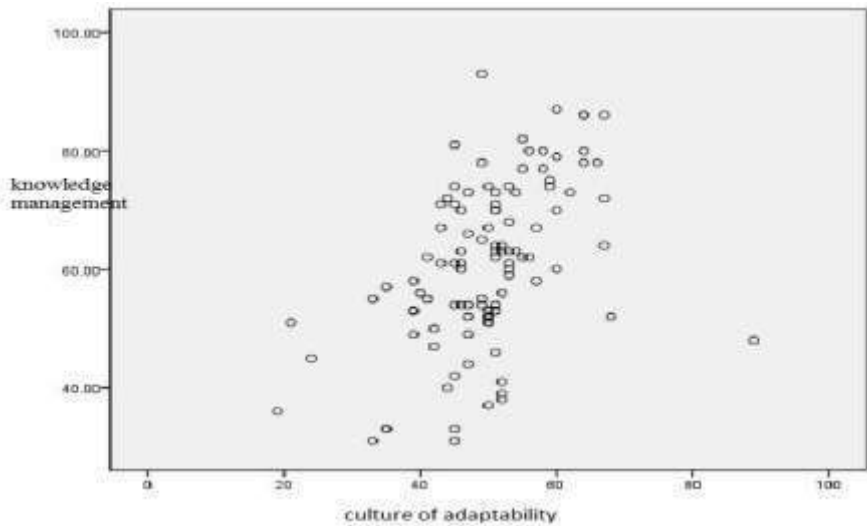


Fig. 3: The correlation Fig. between culture of adaptability and KM

There is a relationship between culture of mission and knowledge management among the nurses working in hospitals of Iranshahr. This hypothesis is tested using Spearman correlation at $\alpha=0.05$. The p value is less than alpha, so: the hypothesis of no correlation between culture of mission and knowledge management among the nurses working in hospitals of Iranshar is rejected. The correlation coefficient was obtained for culture of mission and knowledge management as 0.60, i.e. a significant direct relationship exists between culture of mission and knowledge management among the nurses working in hospitals of Iranshahr [Table 5]

Table 5: The results of Spearman correlation test between culture of mission and KM among nurses of Iranshahr hospitals

Variable	Mean	Sd	r	p
Culture of Mission	47.75	10.699	R= 0.600	P= 0.000
Knowledge management	60.573	13.769		

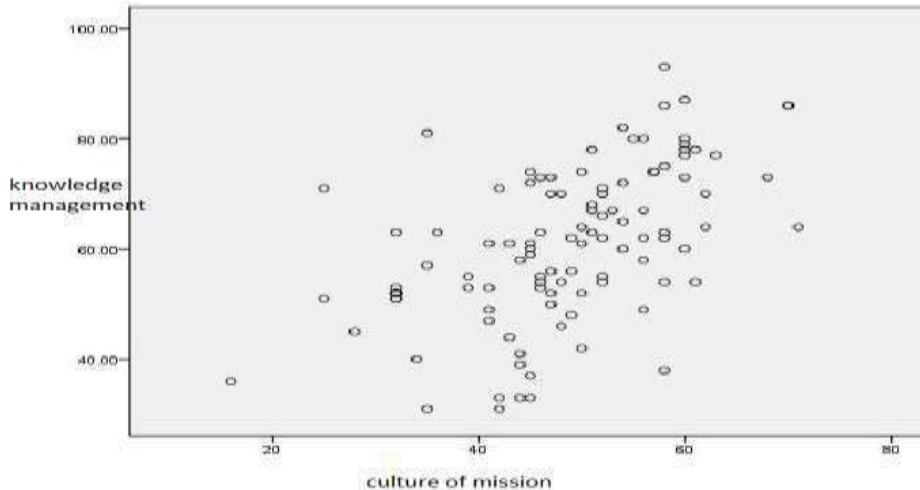


Fig. 4: The correlation Fig. between culture of mission and KM

The main hypothesis

There is a relationship between organizational culture and knowledge management in the nursing system in hospitals of Iranshahr. This hypothesis is tested using Spearman correlation at $\alpha=0.05$. The p value is less than alpha; so, the hypothesis of no correlation between organizational culture and knowledge management in the nursing system at hospitals of Iranshar is rejected. The correlation coefficient was obtained for organizational culture and knowledge management as 0.620, i.e. a very significant direct relationship exists between organizational culture and knowledge management in nursing system at hospitals of Iranshahr. [Table 6]

Table 6: Spearman correlation test for organizational culture and KM in nursing system of Iranshahr hospitals

Variable	Mean	Sd	r	p
organizational culture	195.873	31.865	R= 0.620	P= 0.000
Knowledge management	60.573	13.769		

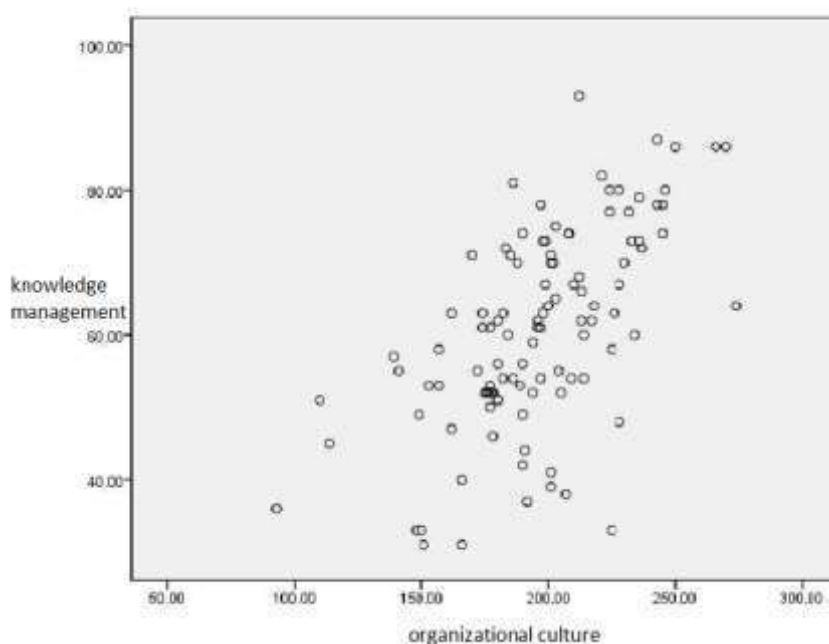


Fig. 5:The correlation Fig. between organizational culture and KM

DISCUSSION AND CONCLUSION

The present study was aimed at investigating the relationship between organizational culture and knowledge management in nursing system of Iranshahr hospitals. However, the results obtained from the questionnaires showed that, in the main hypothesis the organizational culture and knowledge management has a significant direct relationship. Also, test results show the significance of all components of culture of the organization (culture of involvement, the culture of consistency, the culture of adaptability, culture of mission) with knowledge management. The generalizability of findings was found to be good. The findings of Hussein Gholizadeh (2004) showed that 50.5% of changes in Knowledge management is explained by the organizational culture, and the aspects of organizational culture is effective on successful knowledge management. In another study at the educational units, results showed that team morale and cohesion (culture of involvement) is effective on knowledge sharing [9]. And in the Ghorbanzadeh et al. (2008) results show that the organizations that are interested in using the benefits of knowledge management should pay more attention to organizational culture, managers support, organizational structure, human resources and technology management to work in coordination with the knowledge management system [19].

As the results of this study indicate, organizational culture plays a significant role in the creation and development of knowledge management; and knowledge creation can be developed quickly in the hospitals. As Nonaka et al. expressed in Organizational Knowledge Creation cycle, sharing knowledge is the first step in the process of knowledge management and basically knowledge management plays an important role in the success of an organization [20].

The obtained results in this study points that knowledge management cannot be defined as information management or data processing. Knowledge management is essentially a human and social process which is of course facilitated and possible through technical and technological approaches [21]. The results show organizational culture has the greatest impact on knowledge management. According to Prabest and Rumhardt (1950) access to tools alone cannot guarantee knowledge management; thus, organizational culture can be useful in encouraging people to volunteer knowledge management [22]. Gu 2002, Rawli, 2002, Soleman and Spooner, 2000; Dulong and Fehi, 2000; Swibi and Simon, 2002; Vanger, 2003; Vanrog 1998; Dale and Garison, 1998; Counter, Austin, and Juck, 1992; Renzel, 2006; Brink, 2001; and Young and Wun, 2003 agree that organizational culture based on trust can encourage people to interact and manage knowledge with others [23].

In view of the above findings, it can be concluded that knowledge management as an organizational strategy requires the support of organizational culture rather than technical support. Hence, paving the way for the establishment and implementation of the Knowledge management system in the sense that makes members of the organization ready to cooperate in the implementation of knowledge management is very important. Effort to promote organizational culture dimensions (culture of involvement, culture of consistency, culture of adaptability and the culture of mission) to facilitate knowledge management cycle

is recommended to managers and decision-makers of medical universities and hospitals. The findings of this study can be applicable to organizations, especially hospitals that want to gain competitive advantage and the benefits of knowledge management in the current turbulent and complex world.

CONFLICT OF INTEREST

Authors declare no conflict of interest.

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FINANCIAL DISCLOSURE

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REFERENCES

- [1] Ahuiee M.[2013] Review of implementation of knowledge management process in Zahedan University of Medical Sciences". Master's thesis. Islamic Azad University, Science and Research.,
- [2] Davenport, Thomas and Prusak, L. [2000] knowledge management translated by Rahmanseresht, Tehran, Sopko,
- [3] Alvani, S.M. and Danaeefard, H. "speeches in the philosophy of government agency theory" Tehran, Safar Publishing, 1st ed., in 2001
- [4] Zarei Matin, Hassan. [,2000.]Human Resource Management", Qom Seminary Publications Center
- [5] Etemadian M. et al. excellence of hospital based on EFQM model. Tehran: Vajepardaz, 1st ed. 2008
- [6] Gholizadeh Hussain, Rizwan.[2004] Survey of Knowledge Management at the University of Ferdowsi based on Nonaka's theory and its relation to cultural Organization. "Master's thesis. Ferdowsi University of Mashhad,
- [7] D. Bhatt, Ganb. Knowledge management in organizations. Translation: Iranshahi, Muhammad. Tehran, Journal of Science and Informatics, 1998
- [8] Ostad Hasanlu, Hussein, 2011. Investigating the relationship between organizational culture and desire for quality assessment in Social and behavioral science departments of Tehran University, Faculty of Psychology and Educational Sciences
- [9] Denison.(2006). Organization Culture And Effectiveness. Available At [Http:// Wwww.Tnellent/ Organization Culture.Pdf](http://www.Tnellent/Organization Culture.Pdf).
- [10] Schein, Edgar H. (2004). Organizational Culture And Leadership. Sanfrancisco: John Wiley And Sons, Inc.
- [11] Abdorrahmani, Reza. (2009) Introduction to informal organziatioal culture of Police. Journal of Police Studies. 9 (3):31-58
- [12] Parsaeian A, Arabi S.Mohammad (Translators). An introduction to organizational behavior. Volume III, by Stephen Robbins, Tehran: Office of Cultural Research, 1999
- [13] Nonaka I, Toyama R. [2005] The Knowledge-Creating Theory Revisited: Knowledge Creation As A Synthesizing Process. Knowledge Management Research & Practice 1, 2-10
- [14] Nonaka, I., Toyama, R., And Konno, N., (2000). Seci, Ba And Leadership: A Unified Model Of Dynamic Knowledge Creation. Long Range Planning, 33(1):5-34.
- [15] Karami M.[2005] Examining the relationship between organizational culture and knowledge management deployment in Bahman automotive group: Behman Automobile Center" Master's thesis: Tehran University, Faculty of Psychology and Educational Sciences,
- [16] Denison, D.R.(2000). "Organizational Culture: Can It Be A Key Lever For Driving Organizational Change?" International Institute For Management Development,Denison@Imd.Chapter2.
- [17] Shirin, Ali. The relationship between organizational culture and organizational structure in Management and Planning Organization, the thesis Master of Public Administration, former State Management Training Center, 2002.
- [18] Galvani M.[2008] Examining the relationship between organizational culture and knowledge management in Iran Khodro Company. Master's Thesis, Department of Management and Accounting, Allameh Tabatabaei University
- [19] Ghorbanzadeh V. (2008). organizational learning and learning organization with a view to knowledge management. Tehran: Baztab.
- [20] Nonaka I, Toyama R, Nagata A. [2000] A Firm As A Knowledge-Creating Entity: Anew Perspective On The Theory Of The Firm. Industrial And Corporate Change, Oxford, March, 9(1):1-20
- [21] Salyz, Edward; Jones, Gary (2008). Knowledge management in educational organizations. Translated by M. Ahanchian and R Hosseingholi Zadeh, Tehran: Institute for Education Studies
- [22] Delong DW , Fahey L.[2000] "Diagnostic Cultural Barriers To Knowledge Management" Academy Of Management Executive, 14(4)
- [23] Brink P. [2001]. Measurement of Conditions For Knowledge Sharing. Published In: Proceedings 2nd European Conference On Knowledge, Bled.

ARTICLE

AN INVESTIGATION TO SEISMIC PERFORMANCE OF ORDINARY REINFORCED CONCRETE MOMENT RESISTING FRAMES UNDER INTENSE EARTHQUAKES

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ABSTRACT

In the current research, the seismic performance of three multi-story reinforced concrete frame building has been studied. The three typical reinforced concrete moment-resisting frame buildings were designed according to the current Iranian seismic code (IS 2800-14). Three earthquake records were selected and scaled based on IS 2800-14 requirements. In order to assess the seismic vulnerability of the case study structure, nonlinear dynamic time-history analysis has been conducted. The performance has been evaluated based on both the member and global level criteria. The numerical results additionally show that the case-study building frames designed by IS 2800-14 satisfy the intended code requirements and meet the inter-story drift ratios but they failed to meet maximum plastic rotation demands suggested by Guide 360 (Instruction for Seismic Rehabilitation of Existing Buildings). Therefore they need to be rehabilitated against seismic demands.

INTRODUCTION

Earthquakes are known as the most destructive phenomena due to their widespread damage on buildings, bridges and etc. A large number of building structures are affected by earthquakes, hence they should design to resist its effects. This design shall incorporate the seismic behavior of the building structures. Design codes propose different methods of analysis and design of the building structures against seismic loads, like equivalent static, nonlinear static, linear dynamic and nonlinear dynamic methods. The earthquake resistant building design code that implemented in Iran is standard No. 2800 that is revised in 2015.

Equivalent static method uses the behavior factor R to convert the elastic response to inelastic one. Nonlinear analysis methods could be used to obtain exact global and local responses. The basic parameter should be estimated in the nonlinear methods, is the ultimate displacement capacity of lateral bearing system. One of the most important factors having role in estimation of the ultimate displacement capacity is the effective stiffness of the lateral bearing system.

Primary studies that used static nonlinear analysis are based on the simplified first mode based lateral loading patterns in the estimation of capacity curve of building structures, namely Freeman et al. [1], Saiidi and Sozen [2], Fajfar and Fischinger [3]. In the last decade the seismic codes prefer the inelastic displacements in spite of elastic displacements of elements [4]. There are some studies on the seismic behavior of reinforced concrete frames that designed based on Iranian seismic standard 2800 [5].

Purpose of the current paper is to investigate seismic behavior of RC frame building structures with moderate ductility that designed based on 4th edition of Iranian Seismic Design Code (Standard No. 2800). The effect of bay dimension increase, story height increase also number of stories increase, on the seismic behavior of RC frame building structures is investigated. The dynamic nonlinear time history method that incorporates the material and geometric nonlinearities along with difference of velocity and accelerations is used to analyze the behavior of structures studied here.

In the subsequent parts of the paper, the studied samples are introduced and selection method of strong ground motion records, analyze conduction method and etc., along with analysis results are briefly explained.

MATERIALS AND METHODS

Three RC frames are investigated in this study, namely Model 1, Model 2 and Model 3. The geometric properties of these samples are shown in [Fig. 1] and summarized in [Table 1]. [Table 2] summarizes the material properties assumed in this paper.

Gravity loading of samples is conducted based on 6th issue of national building code of Iran and summarized in [Table 3]. Lateral loading is based on the Iranian seismic design standard no. 2800. The selected samples are designed based on equivalent static method considering ordinary ductility requirements of ACI 318-11 code of the United States of America.

KEY WORDS

Seismic Design,
Reinforced Concrete
Frame, Seismic
Performance, Drift,
Plastic Rotation

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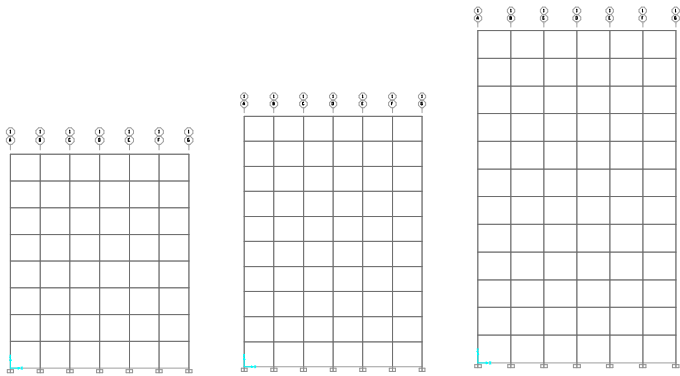


Fig. 1: Elevation view of studied samples.

Table 1: Geometric properties of studies samples

Model name	Number of stories	Story height (m)	Number of bays	Bay length (m)
Model 1	8	3.60	6	4.00
Model 2	10	3.80	6	4.50
Model 3	12	4.20	6	5.00

Table 2: Material Properties

Material Name	Yielding Strength (kg/m ³)	Ultimate Strength (kg/cm ²)	Weight of Unit Volume (kg/m ³)
Steel	4000	4800	7850
Concrete	250	200	2400

Table 3: Gravity loading properties

Load Case	Load Amount (kg/m ²)
Dead	550
Story Live	200
Roof Live	150

To analyzing of the samples, one should use a structural analysis method. Nowadays there are many computer based software uses finite element method to analyze the building structures. In this paper the well-known finite element software SAP-2000 is implemented to analyze and design of samples studied. Due to the symmetry of the samples geometry and loading, just one lateral resisting frame of each sample is considered in the studies. This is a beneficial assumption from numerical cost point of view. Also it is assumed that the roof diaphragms have solid behavior in their plane and the lateral frames carry lateral loads proportional to their stiffness. SAP-2000 implements Beam-Column formulation to simulate the structural behavior of frame elements of the structure. The assumed degree in local and global coordinate system along with global stiffness matrix is shown in the [Fig. 2].

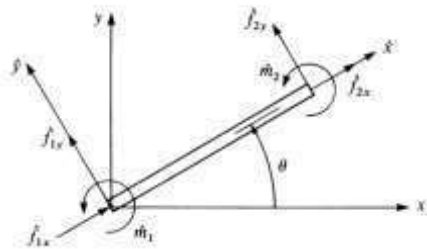


Fig. 2: Local, Global degree of freedom beam-column element in the SAP-2000

There are two important challenges in simulation of beam and columns (1) force-deformation relationship, (2) estimation of deformation capacity should conducted with acceptable accuracy. These parameters are introduced in guidelines and technical notes like FEMA 356 and standard 360 of Iran [6]. So the required parameters are extracted from standard 360 and introduced to the SAP-2000. The procedure of defining the nonlinear behavior of plastic hinges of beams and columns in SAP-2000, are shown in [Fig. 3] and [Fig. 4] respectively.

The information required to define the above mentioned hinges are available in the standard 360 of Iran [6] as shown in [Fig. 5].

There are two local and global damage criteria that should be considered in seismic behavior studies of building structures. Local damage criteria are (1) Immediate Occupancy, IO, (2) Life Safety, LS, (3) Collapse Prevention, CP, that determined based on plastic rotation of plastic hinges under earthquake motions. The global damage criterion is maximum inter-story drift ratio determined from a nonlinear time history analysis.

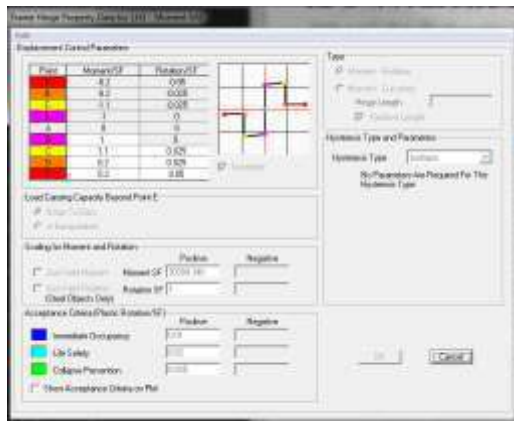


Fig. 3: Definition of plastic hinge properties of beams in flexure

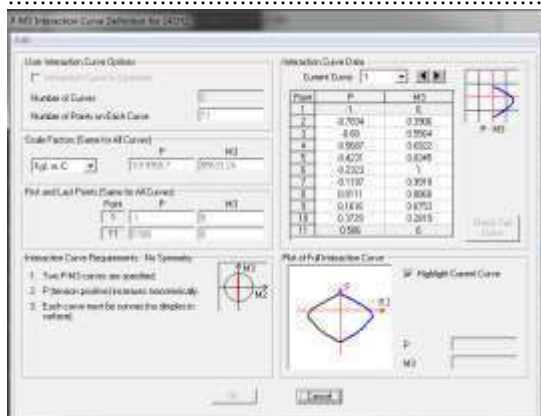


Fig. 4: Definition of plastic hinge properties of columns (Axial-bending interaction diagram)

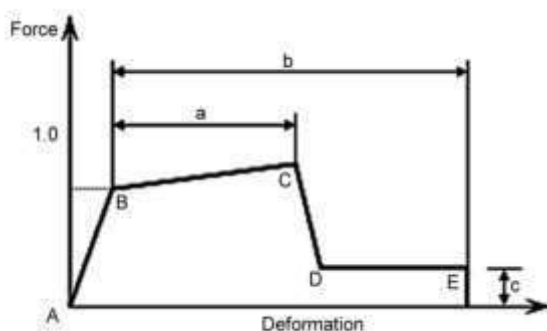


Fig. 5: Force-Deformation relationship provided in standardNo. 360 [6]

In the nonlinear time history analysis, we need to introduce the damping matrix to the finite element software. One of the methods to determine damping matrix is righley method that is based on modal analysis method. The modal analysis method indeed is a eigenvalue problem that solves the characteristic equation of structure as follows:

$$[K - \omega^2 M][\Phi] = 0 \quad (1)$$

In [Eq. 1], K is structural stiffness matrix, ω is natural frequency and M is structural mass matrix determined based of finite element method. Also Φ is modal shape matrix. To solve the eq. 1, one needs to determine the eigenvalues of coefficient matrix $[K - \omega^2 M]$, then the eigenvectors could be determined. So one should solve eq. 2 as follows:

$$|K - \omega^2 M| = 0 \quad (2)$$

Generally in dynamic analysis of building structural systems, considering that most of the structural mass is concentrated in story levels, each story is considered as a concentrated mass, and in two dimensional modeling, it is considered as a concentrated mass with one lateral degree of freedom. The gravitational degree of freedom is neglected due to the near solid behavior of structural columns in axial direction that is parallel to gravitational degree of freedom. So, each of samples that investigated here has an important vibration mode shape. The natural frequencies of each model is determined by modal analysis option of SAP-2000 and summarized in [Table 4].

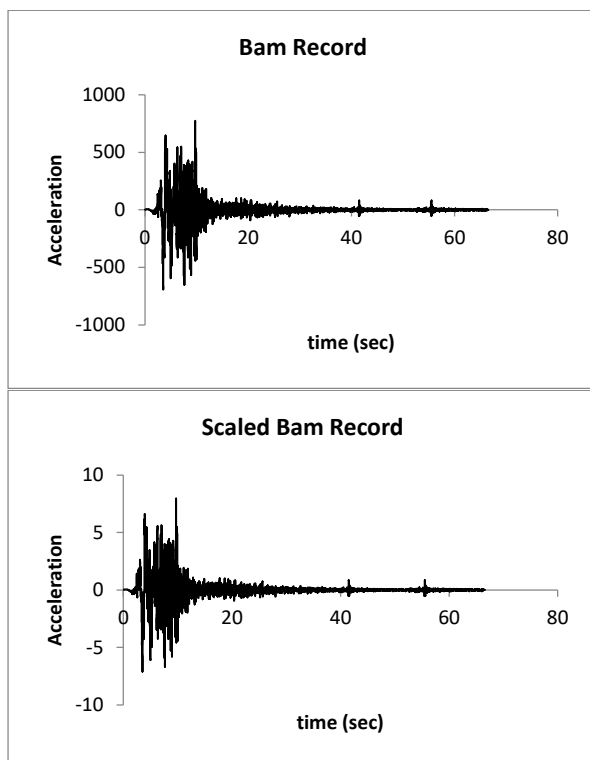


Fig. 6: BAM ecored

To investigate the seismic behavior of the designed samples of part 2, the non-linear time history analysis has been implemented. In the current section, the most important features of this analysis method and its required procedures are introduced. In concise words, to conduct a non-linear time history analysis, one should select some strong ground motion records and scale them to a target spectral acceleration based on seismic codes. This matter is conducted based on Iranian seismic standard no. 2800. Also one should consider and exactly model the material and geometrical non-linear behavior of the structural elements, which have been explained in part 3.

Earthquake resistant building structures design codes like Iranian standard no. 2800, introduce some specifications about selection of strong ground motion time histories to conduct time history analysis. These specifications are (1) site properties, (2) strong ground motion properties [5]. In the other words, the selected strong ground motion should be consistent with site soil conditions and its response spectrum should be conforming to the design spectrum.

Considering abovementioned tasks, three strong ground motion records have been selected and summarized in [Table 5]. Scaling procedure of these records is based on Iranian standard no. 2800. [Fig. 6,7, 8] shows the acceleration time history of selected records, before and after scaling, respectively. To study more the features of these records, the Fast Fourier Transform (FFT) and acceleration response spectra of each are obtained by the means of Seismosignal software and are summarized in [Fig. 9 ,10, 11].

Table 4: Natural frequencies of investigated models.

Mode No.	Model 1	Model 2	Model 3
1 st Mode	0.5	0.8	1.12
Last Mode	0.05	0.08	0.11

Table 5: Selected earthquake records.

Event name	PGA (g)	Time (s)
Bam	0.98	65
Golbaf	0.54	14
Zarand	0.51	80

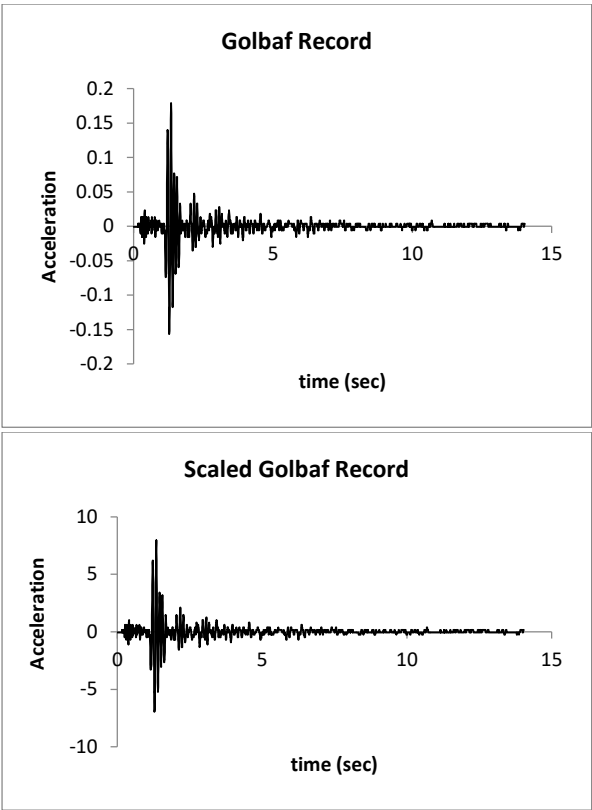


Fig. 7: GOLBAF record

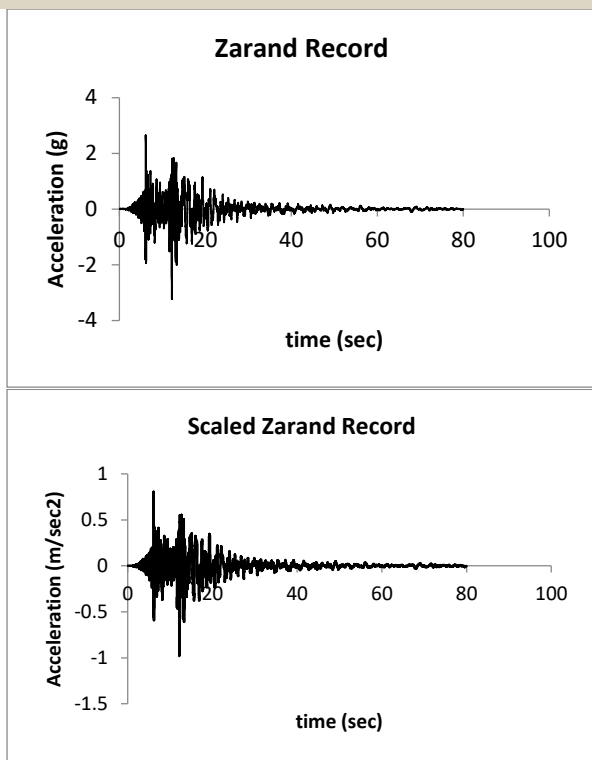


Fig. 8:ZARAND
record.....

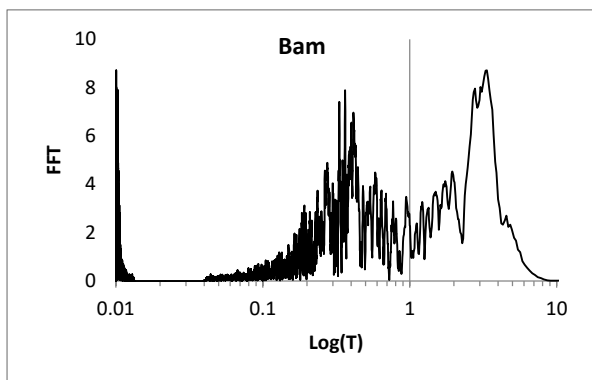


Fig. 9:Bam FFT
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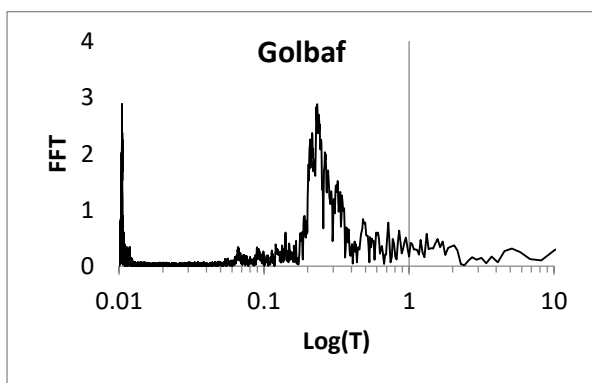


Fig. 10:Golbaf FFT
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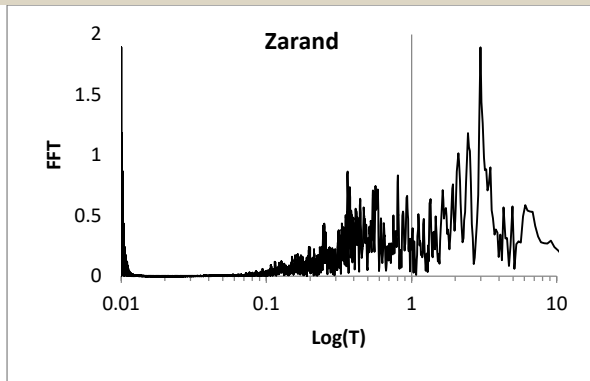


Fig. 11: Zarand FFT

Investigation of the diagrams of FFT shown in [Fig. 9] to [Fig. 11] reveal that the selected records are very different from frequency content point of view. In the FFT of Bam record, most of wave amplitudes are concentrated in periods ranging from 1s to 3s. But for Golbaf record, this range is between 0.2s to 0.5s and for Zarand event, the governing range is periods above 2s. In the subsequent parts studies will show that the governing periods of the sample structures of current study is between 0.5s to 1.15s. So it is expected that the studied samples will suffer extensive damage under Bam earthquake. It is because the structural periods are in the elastic behavior range and when the samples behave in inelastic behavior range, the periods will be fallen in the range of 1s to 2s that exactly the same with the governing period range of Bam event.

Generally to more deeply studying the selected records, the elastic acceleration response spectrum of selected records are considered. [Fig. 12] compares elastic acceleration response spectrum of three selected records. It should be noted that, for comparison purpose, these spectrums are scaled to $S_a \max = 1$. As it can be seen, the spectrum of Bam event has large spectral accelerations in wide range of periods. The second event is Zarand that has wide period range of large accelerations. Golbaf event is a narrow band one and large accelerations are concentrated to periods of 0.2s to 0.4s and author's experiences show that the Golbaf event could be hazardous for 2 to 5 story building structures, which haven't been studied herein.

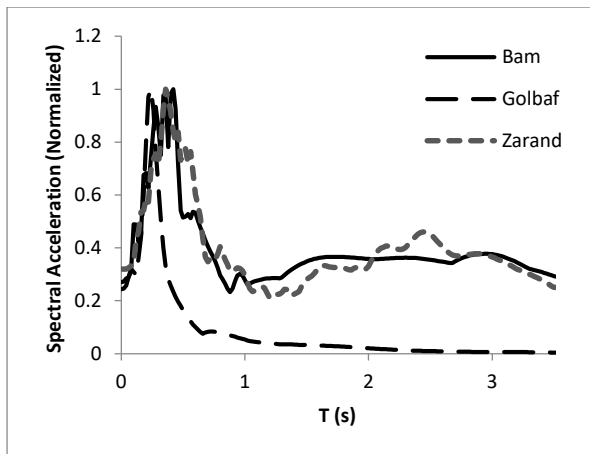


Fig. 12: Elastic acceleration response spectra of one degree of freedom oscillator under selected records

Real damping characteristics of building structures are affected by many parameters and are very hard to known and determine so in practical and research fields, the equivalent viscous damping is used. Studies show that in ordinary building, damping ratio is below 5% of critical damping. In research works, generally the Rayleigh damping method is implemented to obtain damping matrix. The formulation of this method is as follows:

$$C = \alpha_m M + \beta_s K \quad (3)$$

In this equation, M is structural mass matrix, K is structural stiffness matrix. α_m Is mass proportion coefficient and represents the mass contribution in damping. β_s Is stiffness proportion coefficient and represents the

stiffness contribution in damping. To determine α_m and β_s , one need to obtain natural frequencies of important modes of structure and use the following equations:

$$\alpha_m = 2\omega_1\omega_{end}(\xi_1\omega_{end} - \xi_{end}\omega_1)/(\omega_{end}^2 - \omega_1^2) \quad (4)$$

$$\beta_s = 2(\xi_{end}\omega_{end} - \xi_1\omega_1)/(\omega_{end}^2 - \omega_1^2) \quad (5)$$

Non-linear time history analysis conducted using three selected and scaled strong ground motion records. In this section, the seismic performance of studied samples are investigated and compared with together. Generally to investigate the seismic performance of building structures, local and global performance criteria are implemented. The global performance criterion is the inter-story drift ratio distribution along the height of structure and the local performance criterion is the amount of plastic rotations of structural elements that should be compared to acceptance criteria specified by codes like Iranian standard no. 360.

One of the most well-known global performance criteria is the inter-story drift ratio distribution along the height of the building structure. Inter-story drift ratio is the ratio of relative lateral displacement of stories of structure to height of individual story. [Fig. 13] shows this criterion definition briefly. As can be seen, inter-story drift is an index of amount of rotation amount of columns. In this part of study, the results of global performance of structure are summarized. To this end, the non-linear time history analysis is conducted and the time history of displacement of each story of studied samples obtained and shown in [Fig 14]. Inspection of these diagrams shows that the displacement time histories start from zero displacement in time zero. But when the time goes on, the diagrams oscillate around zero displacement but in the end of time, they go a non-zero equilibrium point, and this means that the structure in the end of time is tilted and suffers damage and residual displacements. This is due to cracks in concrete and yielding in steel rebars.

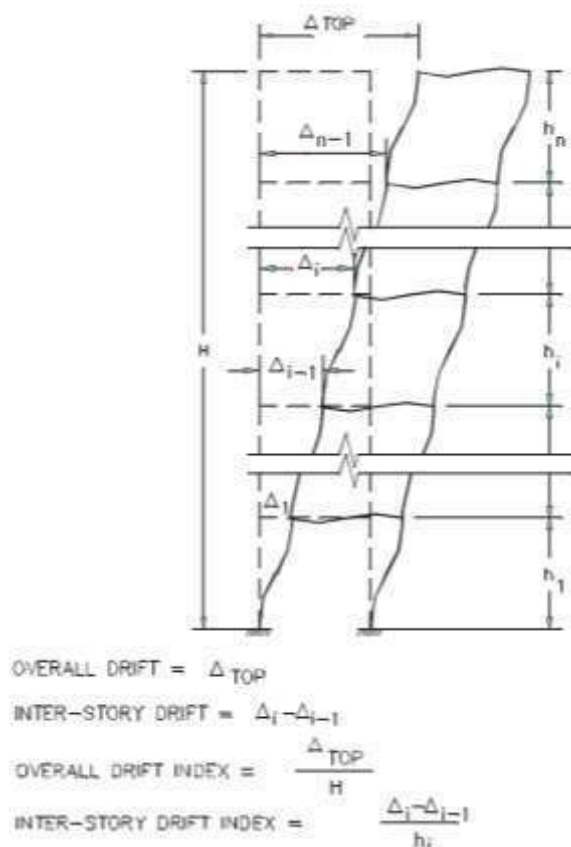


Fig. 13: Drift index definition

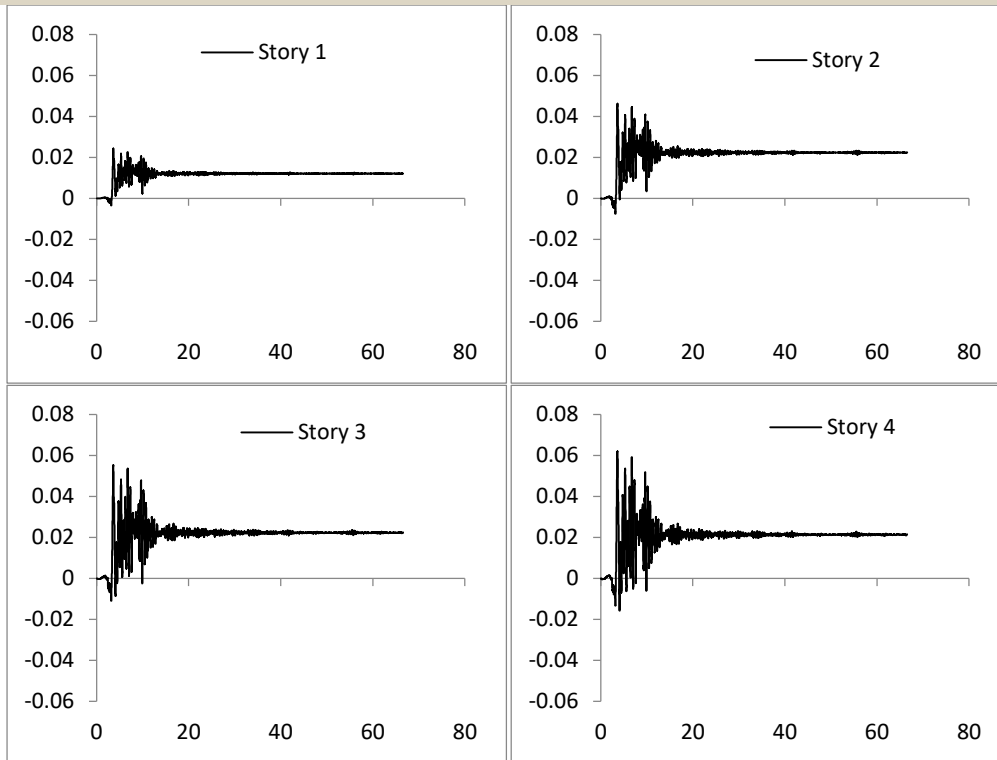


Fig. 14:Time history of displacement sample 1 gravity load 1

Using the displacement time history of stories of the samples, the maximum inter-story drift of each story obtained. A vertical dashed line in [fig. 15] show the accepted lateral drift specified by Iranian standard no. 2800.

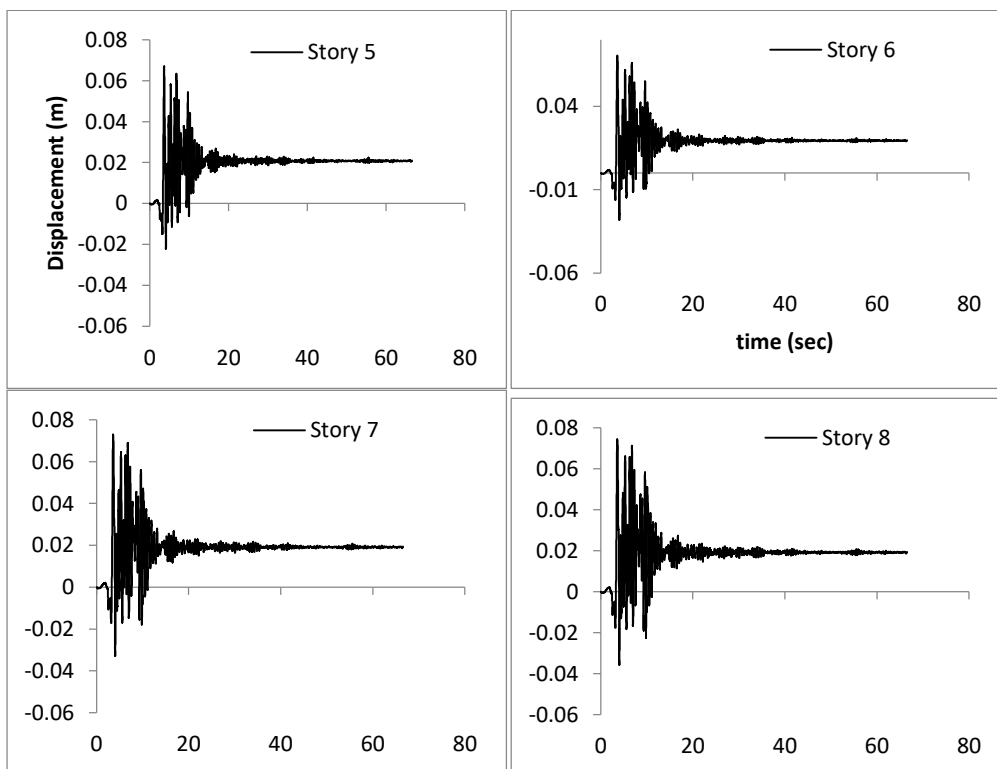


Fig. 14 (Continued):Time history of displacement sample 1 gravity load1

Evaluation of these diagrams reveal that of drift distributions are in acceptable range and as the number of stories increases, the drift ratio distributions are closer to acceptance threshold of Iranian standard no. 2800, hence the risk increases.

The acceptance criteria for the local seismic performances are provided in Iranian standard no. 360 as maximum acceptable plastic rotations in IO, LS and CP performance levels. The values of maximum acceptable plastic rotations are function of reinforcement ratio, confinement, demand to capacity ratio of shear in beams and columns and etc. TheSAP-2000 software is able to compare the plastic rotation demand on elements of structure by the acceptance criteria and report the performance of each element by colored circles in the location of plastic hinges, so the researcher and designer could understand the structures performance. [Fig.16] summarizes the plastic rotation report of SAP-2000 for each of investigated elements.

[Fig. 16] shows the plastic rotation conditions in sample 1 under Bam record. Investigating these figures reveal that all the plastic hinges of beams are exceeded the IO performance index and all except lower story columns are exceeded LS and one of the lower story columns exceeded CP performance index.

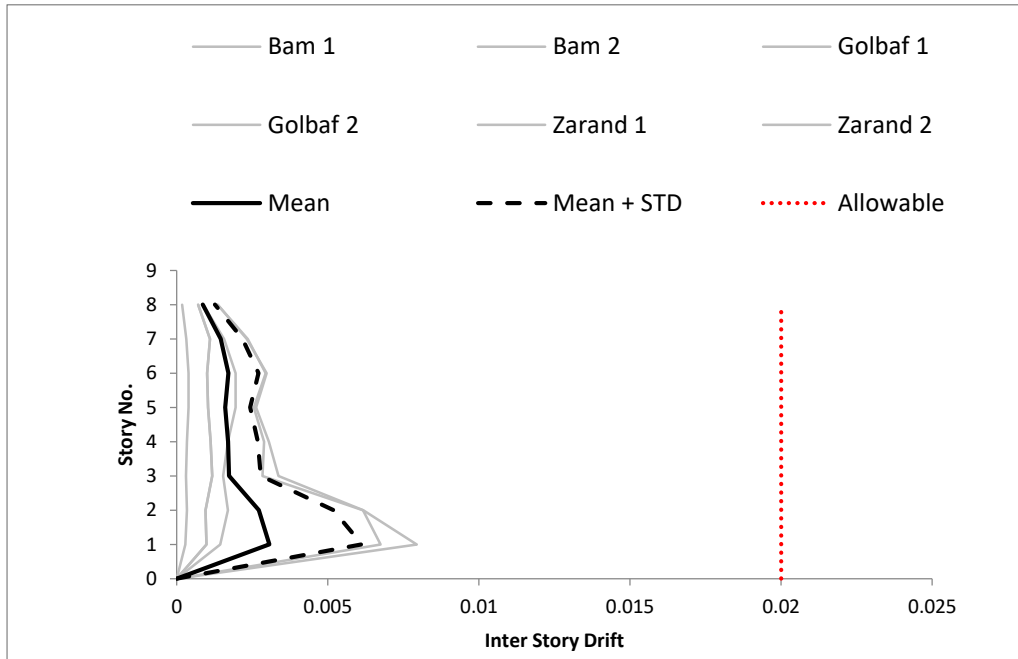
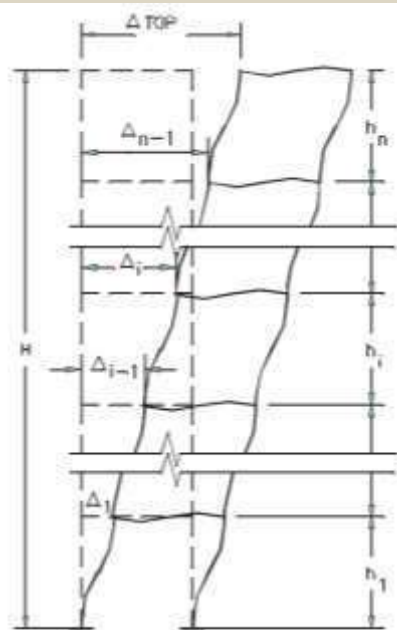


Fig. 15: Inter-story drift distribution for sample 1.

RESULTS

One of the most well-known global performance criteria is the inter-story drift ratio distribution along the height of the building structure. Inter-story drift ratio is the ratio of relative lateral displacement of stories of structure to height of individual story. [Fig. 13] shows this criterion definition briefly. As can be seen, inter-story drift is an index of amount of rotation amount of columns. In this part of study, the results of global performance of structure are summarized. To this end, the non-linear time history analysis is conducted and the time history of displacement of each story of studied samples obtained and shown in [Fig 14]. Inspection of these diagrams shows that the displacement time histories start from zero displacement in time zero. But when the time goes on, the diagrams oscillate around zero displacement but in the end of time, they go a non-zero equilibrium point, and this means that the structure in the end of time is tilted and suffers damage and residual displacements. This is due to cracks in concrete and yielding in steel rebars.



OVERALL DRIFT = Δ_{TOP}

INTER-STORY DRIFT = $\Delta_i - \Delta_{i-1}$

OVERALL DRIFT INDEX = $\frac{\Delta_{TOP}}{H}$

INTER-STORY DRIFT INDEX = $\frac{\Delta_i - \Delta_{i-1}}{h_i}$

Fig. 13:Drift index definition

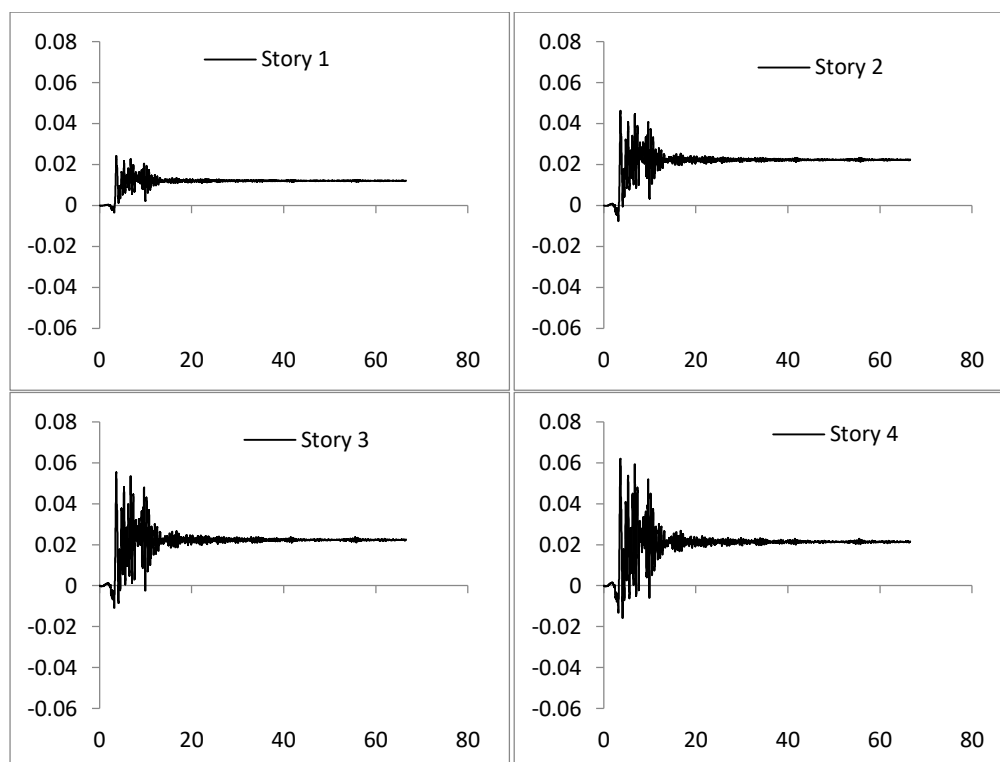


Fig. 14:Time history of displacement sample 1 gravity load 1

Using the displacement time history of stories of the samples, the maximum inter-story drift of each story obtained. A vertical dashed line in [fig. 15] show the accepted lateral drift specified by Iranian standard no. 2800.

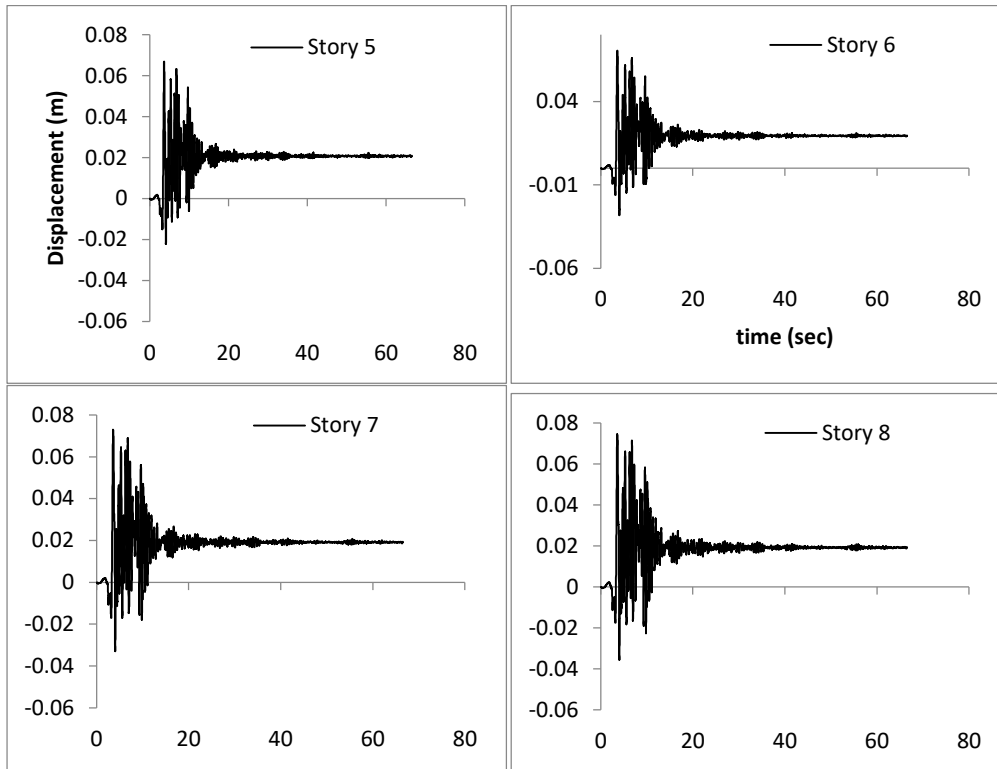


Fig. 14 (Continued):Time history of displacement sample 1 gravity load1

Evaluation of these diagrams reveal that of drift distributions are in acceptable range and as the number of stories increases, the drift ratio distributions are closer to acceptance threshold of Iranian standard no. 2800, hence the risk increases.

The acceptance criteria for the local seismic performances are provided in Iranian standard no. 360 as maximum acceptable plastic rotations in IO, LS and CP performance levels. The values of maximum acceptable plastic rotations are function of reinforcement ratio, confinement, demand to capacity ratio of shear in beams and columns and etc. The SAP-2000 software is able to compare the plastic rotation demand on elements of structure by the acceptance criteria and report the performance of each element by colored circles in the location of plastic hinges, so the researcher and designer could understand the structures performance. [Fig. 16] summarizes the plastic rotation report of SAP-2000 for each of investigated elements.

[Fig. 16] shows the plastic rotation conditions in sample 1 under Bam record. Investigating these figures reveal that all the plastic hinges of beams exceeded the IO performance index and all except lower story columns are exceeded LS and one of the lower story columns exceeded CP performance index.

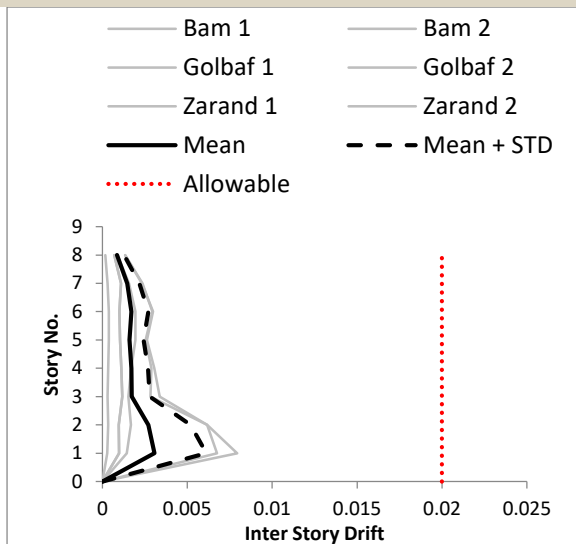


Fig. 15:Inter-story drift distribution for sample 1.

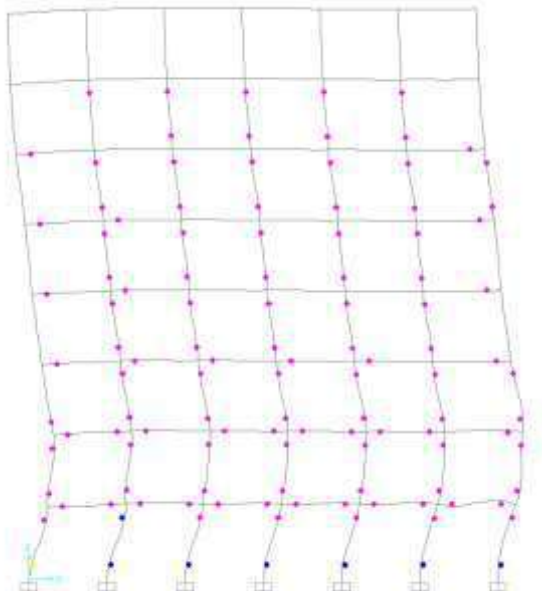


Fig. 16:Plastic hinges in model 1 under Bam record

The wound edge was freshened with B.P. blade to improve vascularity. Buccal fistula was repaired with catgut no. 2 and skin was sutured with silk thread. Another rectangular hard leather piece of size slightly greater than diameter of fistula was placed on outer skin opening of fistula and knot was secured on the outer hard leather piece [Table 1].

CONCLUSION

In this paper the seismic behavior of three sample reinforced concrete moment frames with intermediate ductility having 8, 10 and 12 stories are investigated using non-linear time history analysis under three strong ground motions of Bam, Zarand and Golbaf earthquakes. The samples are designed using equivalent static method of Iranian standard no. 2800. Then their seismic behavior is investigated using non-linear time history analysis. The results of non-linear time history analysis investigated from 2 point of

view of local and global performance criteria. Local performance criterion is rotation of plastic hinges and global one is the distribution of inter-story drift along the height of structures.

FFT distribution of selected records is studied and it showed that the Bam record has a high frequency content compared to other two records. So it is expected to samples suffer more damage under this record.

Non-linear time history analysis of individual samples under each strong ground motion acceleration record conducted and the inter-story drift along the height of structures and the plastic rotations of plastic hinges obtained and investigated. Results show that investigated samples have acceptable from global performance but the local criteria of some models are exceeded allowable amounts.

REFERENCES

- [1] Freeman, S.A., Nicoletti, J.P., and Tyrell, J.V. (1975) Evaluation of existing buildings for seismic risk - A case study of Puget Sound Naval Shipyard, Bremerton, Washington. Proceedings of U.S. National Conference on Earthquake Engineering, Berkley, USA, 113-122.
- [2] Saiidi, M. and Sozen, M.A. (1981) Simple nonlinear analysis of RC structures. Structural Division, ASCE, 107, 937-951.
- [3] Fajfar, P. and Fischinger, M. (1988) N2-A method for non-linear seismic analysis of regular buildings. The Ninth World Conference in Earthquake Engineering, Tokyo-Kyoto, Japan, 5, 111- 116.
- [4] Performance Based Seismic Engineering of Buildings (Ed.) (2000) Structural Engineers Association of California (SEAOC) Sacramento, California, USA.
- [5] Standard No. 2800 (Ed.) (2014) Iranian Code of Practice for Seismic Resistant Design of Buildings (IS 2800-14). Building and Housing Research Centre, Tehran, Iran.
- [6] Instruction for Seismic Rehabilitation of Existing Buildings (Guide 360) (2002) Management and Planning Organization of Iran, Iran.

ARTICLE

A COMPARATIVE STUDY OF THE EFFECTS OF NORMAL SALINE AND HYDROXYETHYL STARCH 6% ON MOTHERS' BLOOD PRESSURE DURING SPINAL ANESTHESIA IN ELECTIVE CESAREAN SECTION

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ABSTRACT

Introduction: Hypotension is the most common problem after spinal anesthesia in women volunteered for cesarean section. This complication can be prevented by hydrating the patient with a suitable and stable serum. The present study intended to compare the effects of normal saline and hydroxyethyl starch 6% on reducing hypotension in women volunteered for cesarean section after spinal anesthesia.

Methodology: To this end, a clinical trial was conducted on 72 pregnant women who were volunteered for cesarean section in Shahid Motehari Hospital in Jahrom, Shiraz. The eligible patients were randomly divided into two groups of 36. Both the blood pressure and heart rate of patients were measured after entering the operating room and before spinal anesthesia. An amount of 15-20 cc normal saline per kilogram of body weight was injected intravenously to the patients of the first group about 15 minutes prior to spinal anesthesia while 5-10 cc of hydroxyethyl starch per kilogram of body weight was injected intravenously to the second group. Systolic and diastolic blood pressure as well as heart rate of the patients were measured within 5, 10 and 15 minutes after anesthesia and then every 10 minutes until the end of C-section operation. Data were analyzed in SPSS¹¹ using Mauchly's Sphericity Test and Greenhouse-Geisser test.

Results: Over time there was a statistically significant difference in the systolic and diastolic blood pressure between both groups and between the time and type serum ($P < 0.001$). In case group (HES), the mean of baseline systolic blood pressure was 124.9 mmHg as well as 123.7 and 112.2 mmHg respectively 15 and 30 minutes after the operation. On the contrary, the mean of baseline blood pressure was 123.9 mmHg as well as 94.3 and 103 mmHg respectively 15 and 30 minutes after the operation in control group (NS). The incidence of hypotension was 11% in HES group and 25% in NS group. **Conclusion:** In addition to hypotension reduction, hemodynamic instability was also lower in HES than NS group. However, there was not any significant difference in the heart rate and neonatal Apgar between both groups. Consequently, hydroxyethyl starch may be effective in preventing hypotension.

INTRODUCTION

KEY WORDS

Spinal Anesthesia; Blood Pressure; Elective C-section; Neonatal Apgar; Hydroxyethyl Starch (HES) 6%; Normal Saline (NS).

Nowadays, cesarean is done using different types of anesthesia and general anesthesia. One of the preferred methods is spinal anesthesia [1] which is more applicable since it not only reduces difficult intubation and bleeding during the operation but also inhibits the use of respiratory neuro-suppressive drugs which are transferred through placenta to the fetus [2]. Nevertheless, this method causes some complications including nausea, vomiting and headache; its most important and prevalent complication is hypotension due to the spinal cord sympathectomy, peripheral vascular vasodilatation, reduction of venous return to the heart and reduction of cardiac output [3]. Studies has found that pregnant women who are lying position undergo a considerable reduction in placental bloodstream despite having a normal brachial blood pressure (4). Since there is not any self-regulation in uterine bloodstream, mother's hypotension, especially with a systolic blood pressure below 90 mm Hg, reduces blood supply to placenta and causes neonatal asphyxia and decreases neonatal Apgar [5].

Hypotension, caused by spinal anesthesia, is treated through two main treatment methods due to its physiological causes i.e. increased systematic vascular resistance and increased intravascular fluid volume (6); Ephedrine is a preferred medication for the former method. Nevertheless, Ephedrine causes Acidemia in fetus and neonatal nervous system abnormalities [7].

Pre-hydration is the infusion of intravenous fluid within 15 – 20 minutes before spinal block to fill the vascular capacity. The fluids used for pre-hydration are Crystalloids and Colloids [8]. Like Ringers, Crystalloids have a short half-life in bloodstream and are not good vasodilators. Several studies showed that the prescription of crystalloids could not maintain a safe and steady blood pressure level in patients during the operation [9]. Pre-hydration with high doses of fluid may increase central venous pressure and pulmonary edema [10 & 11]. Colloid fluids have a longer stay in the vessel and require less fluid to increase blood pressure [12]. Hydroxyethyl Starch 6% solution is a kind of colloid fluids which is used to treat hypotension in trauma and shock [13]. This solution can be a good choice used for pre-hydration in

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spinal anesthesia. One of the complications of colloids is their effects on coagulation system which decrease the levels of Factor 8 and Von Willebrand. However, these effects are much less influential in solutions with average molecular weight than in solutions with high molecular weight (14).

According to the studies reporting the success of this solution in reducing the incidence of hypotension and spinal anesthesia complications as well as the significance of spinal anesthesia in pregnant women and its effect on their infants, and in order to compare the effect of intravenous solutions including hydroxyethyl starch 6% and normal saline on preventing hypotension, the current study was conducted on women volunteering for C-section operation [15].

The present project requires more investigation with regard to the spinal anesthesia complications and its resulting hypotension and due to observation of different results obtained from previous studies using different serums. Furthermore, the current study was conducted since hypotension reduction has significant effects, including Asphyxia and neonatal Apgar decrease, on infants which may bring about negative effects on infants' growth and their life quality[16].

MATERIALS AND METHODS

The current study is a clinical trial research. The research was instigated after it was approved by the Research council of Jahrom University of Medical Sciences and Ethics Committee and once written consent was reached from patients. Patients with blood pressure, respiratory problems, asthma, allergy and cardiovascular disease were excluded from the study. The present study was conducted on 72 pregnant women, aging 15 – 40, who were volunteered for elective cesarean section with spinal anesthesia class ASA I, II. The eligible patients were randomly divided into two groups of 36 recipients of normal saline and hydroxyethyl starch 6%. Both the blood pressure and heart rate of patients were measured after entering the operating room and before spinal anesthesia. An amount of 15-20 cc normal saline per kilogram of body weight was injected intravenously to the patients of the first group about 15 minutes prior to spinal anesthesia while 5-10 cc of hydroxyethyl starch per kilogram of body weight was injected intravenously to the second group. The temperature was maintained at 23 – 25 °C during the presence of patient in the operating room and recovery room. The spinal anesthesia, in both groups, was done under sterile condition by a trained anesthesiologist in L4 – L5 space using needle number 25 containing 2.5 cc (12.5 mg) of Marcaine 0.5%. Systolic and diastolic blood pressure as well as heart rate of the patients were measured within 5, 10 and 15 minutes after anesthesia and then every 10 minutes until the end of C-section operation by a monitoring device and were recorded by a technician, who was not aware of the type of venous solution. Data were analyzed in SPSS₁₁ using velvet tests and greenhouse grazer tests. Patients were examined in terms of arrhythmia during cardiac monitoring. Data were analyzed in SPSS₁₁ using Mauchly's Sphericity Test and Greenhouse-Geisser test.

RESULTS

In order to measure the adherence of data to normal distribution, all the research variables were examined with Kolmogorov-Smirnov test; it was, therefore, found that all the variables with a statistical value larger than 0.05 ($P > 0.05$) have a normal distribution. Regarding the inevitable effect of age variable, independent T-test was used in order to determine the effect of age on research results. With respect to the mean age of both groups (29.09 ± 4.27 & 28.19 ± 4.13), the other values i.e. $P: 0.39$, $T: 865$ and $DF: 68$ were estimated accordingly. Then, it was measured as a covariate with each individual variable and separately through ANCOVA. Subsequently, there was not any correlation between groups and age ($P < 0.05$). Hence, in further analyses, the changes in systolic blood pressure, diastolic blood pressure and heart rate between both groups were respectively measured through ANOVA with repeated measures. Below are the results:

Systolic Blood Pressure: once the mean and standard deviation of this variable was measured (Table 1), the results of Mauchly's Sphericity Test were evaluated to determine whether it meets compound symmetry condition; since $P: 0.001$, Epsilon Correction Factor was used and, subsequently, Greenhouse-Geisser test was used instead of Sphericity Test. In this regard, three questions were answered:

1. Was there any significant difference in systolic blood pressure between both groups in five periods of time? Yes, there was. according to $P: 0.001$, there was a significant difference in systolic blood pressure between the five periods of time [Table 1].
2. Did the passage of time have any significant difference in systolic blood pressure between both groups? Yes, it did. The statistical value of $P: 0.001$ showed that it was significant.
3. Was there any correlation between time and type serum? Yes, there was. The value of $P: 0.001$ showed that there was a significant correlation between time and type of serum.

Table 1: Mean of Systolic Blood Pressure between both groups in different minutes

Variable	Group	Mean	SD
Systolic Blood Pressure 1	HES	124.94	11.00519
	NS	123.92	12.71079
	Total	124.42	11.82692
Systolic Blood Pressure 2	HES	114.31	13.83468
	NS	99.1667	15.99196
	Total	106.63	16.70350
Systolic Blood Pressure 3	HES	113.77	13.85022
	NS	94.3333	13.16055
	Total	103.92	16.60013
Systolic Blood Pressure 4	HES	114.06	13.96201
	NS	97.3056	9.82655
	Total	105.56	14.63238
Systolic Blood Pressure 5	HES	112.29	11.68853
	NS	103.00	7.19126
	Total	107.58	10.68064

Diastolic Blood Pressure: once the mean and standard deviation of this variable was measured, the results of Mauchly's Sphericity Test were evaluated to determine whether it meets compound symmetry condition; since $P:0.003$, Epsilon Correction Factor was used and, subsequently, Greenhouse-Geisser test was used instead of Sphericity Test. In this regard, three questions were answered:

1. Was there any significant difference in diastolic blood pressure between both groups in five periods of time? Yes, there was. according to $P:0.001$, there was a significant difference in diastolic blood pressure between both groups in the five periods of time (Table 2).
2. Did the passage of time have any significant difference in diastolic blood pressure between both groups? Yes, it did. The statistical value of $P:0.001$ showed that it was significant.
3. Was there any correlation between time and type serum? Yes, there was. The value of $P:0.001$ showed that there was a significant correlation between time and type of serum.
- 4.

Table 2: Mean of Diastolic Blood Pressure between both groups in different minutes

Variable	Group	Mean	SD	Number
Diastolic Blood Pressure 1	HES	78.3143	9.02862	35
	NS	78.8056	12.13453	36
	Total	78.5634	10.64322	71
Diastolic Blood Pressure 2	HES	70.7714	11.74255	35
	NS	59.9722	13.60144	36
	Total	65.2958	13.74918	71
Diastolic Blood Pressure 3	HES	66.9143	10.39053	35
	NS	56.1111	9.87284	36
	Total	61.4366	11.43520	71
Diastolic Blood Pressure 4	HES	66.0000	11.39143	35
	NS	57.3056	6.80260	36
	Total	61.5915	10.26308	71
Diastolic Blood Pressure 5	HES	64.6571	7.91478	35
	NS	60.0000	12.03566	36
	Total	62.2958	10.40933	71

Heart Rate: once the mean and standard deviation of this variable was measured (Table 3), the results of Mauchly's Sphericity Test were evaluated to determine whether it meets compound symmetry condition; since $P:0.001$, Epsilon Correction Factor was used and, subsequently, Greenhouse-Geisser test was used instead of Sphericity Test. In this regard, three questions were answered:

1. Was there any significant difference in heart rate between both groups in five periods of time? No, there wasn't. according to $P:0.52$, there was not any significant difference in the heart rate between both groups in the five periods of time (Table 3).

2. Did the passage of time have any significant difference in heart rate between both groups? Yes, it did. The statistical value of P:0.001 showed that it was significant.
3. Was there any correlation between time and type serum? No, there wasn't. The value of P:0.364 showed that there was not any significant correlation between time and type of serum.

Table 3: Mean of patients' heart rate between both groups in different minutes

Variable	Group	Mean	SD	Number
Heart Rate 1	HES	96.0857	14.28568	35
	NS	100.42	14.78875	36
	Total	98.2817	14.60253	71
Heart Rate 2	HES	95.0286	16.12540	35
	NS	105.08	17.49020	36
	Total	100.13	17.46092	71
Heart Rate 3	HES	94.2000	13.79642	35
	NS	104.78	13.83807	36
	Total	99.5634	14.71611	71
Heart Rate 4	HES	97.0286	13.76801	35
	NS	104.78	14.48962	36
	Total	100.96	14.56948	71
Heart Rate 5	HES	93.1714	11.48781	35
	NS	103.61	14.10629	36
	Total	98.4648	13.82837	71

In present study, the level of hypotension, systolic and diastolic hypotension were described as 20% of the baseline blood pressure after 30 minutes.

Table 4: The incidence of hypotension in both groups

			Systolic Blood Pressure		Total
			<80	>80	
Group	HES	Number	4	31	35
		Group	11.0%	88.0%	100.0%
		Systolic Blood Pressure	30.0%	53.0%	49.0%
		Total	5.0%	43.0%	49.0%
	NS	Number	9	27	36
		Group	25.0%	75.0%	100.0%
		Systolic Blood Pressure	69.0%	46.0%	50.0%
		Total	12.0%	38.0%	50.0%
Total		Number	13	58	71
		Group	18.0%	81.0%	100.0%
		Systolic Blood Pressure	100.0%	100.0%	100.0%
		Total	18.0%	81.0%	100.0%

DISCUSSION

The current study aimed at investigating the effects of two different solutions on preventing spinal anesthesia complications.

1. Hypotension

Hypotension in pregnant women after spinal anesthesia is mainly due to the spinal cord sympathectomy, peripheral vascular vasodilatation, reduction of venous return to the heart and reduction of cardiac output. The variables, measured for this end, were systolic and diastolic blood pressure in different minutes during the operation.

On the one hand, the mean of baseline systolic blood pressure in the recipient group of normal saline was 123.9 which dropped to 99 after 5 minutes, 9.3 after 10 minutes and 103 after 20 minutes. On the contrary, the mean of baseline systolic blood pressure in the recipient group of Hydroxyethyl starch was 124.9 which descended to 114.3, 113.7 and 112.2 respectively after 5 minutes, 10 minutes and 20 minutes.

On the other hand, the mean of baseline diastolic blood pressure in NS recipients was 78.8 which dropped to 59.9, 56.1 and 60 correspondingly 5, 10 and 20 minutes after spinal anesthesia. Whereas, it was 78.8 in HES recipients which fell to 70.7, 66.9 and 64.6 after 5, 10 and 20 minutes respectively.

In the present study, hypotension was defined as a 20% drop in the baseline blood pressure. It was measured 25% in control group and 11% in case group. According to the aforementioned results, it can be concluded that in addition to hypotension reduction, homodynamic instability was also lower in HES than NS group.

Mercier et al. (2014) studied 167 pregnant women who had been divided into 2 groups randomly. One group received 500 cc of hydroxyethyl starch as well as 500 cc of Ringer Lactate while the other was given 1000 cc of Ringer lactate to get hydrated (17). It was found that both hypotension and marked hypotension were lower in HES than RL group (36.6 % vs. 55.3%). The results of Mercier's study were consistent with the findings of the present study (17).

Tomoko Yorozu et al. studied 67 healthy pregnant women who were volunteered for elective cesarean. In one group, 35 patients were hydrated with Ringer Lactate while the other group (32 patients) was hydrated with HES. They found that there was not any significant difference in hypotension between both groups, the results of which were not in line with the current study (18).

2. Heart Rate

Most patients have little or no significant change in heart rate. About 10 to 15% of patients have a significant reduction in heart rate after spinal anesthesia. Like hypotension, bradycardia has a direct relationship with the increase in the level of anesthesia due to the interruption of nerves rattling the heart rate, originating from T1-T4, or reduction in venous blood return.

On the other hand, if blood pressure reduces, heart rate will go up for compensation. In HES group, the mean of baseline heart rate was 96 which fell to 93 after 30 minutes while it was 100 in NS group and ascended to 103 after 30 minutes. The results indicated that changes in heart rate did not have any significant difference between both groups.

Riley et al. compared HES and Ringer Lactate. They found that hypotension in both groups of 0 patients underwent such changes i.e. hypotension was observed in 45% of the cases in the recipients of HES and Ringer Lactate compound while it was 85% in the recipients of RL. Furthermore, the highest recorded heart rate was 115 in RL group whereas it was 104 in HES-RL compound group (9). The findings of Riley's study were in line with the results of the present study.

Tomoko Yorozu et al. studied 67 healthy pregnant women who were volunteered for elective cesarean. In one group, 35 patients were hydrated with Ringer Lactate while the other groups (32 patients) was hydrated with HES. They found that there was not any significant difference in hypotension between both groups (18).

In a similar study by Ennasr L. Ben Mazrouk et al. (2014), similar results were found consistent with the current study. Amongst 60 pregnant women who were hydrated with NS, about 43 patients underwent severe hypotension while amongst 60 patients who were given HES, about 24 patients endured hypotension (19).

Tomoko Yorozu et al. studied 76 healthy pregnant women who were volunteered for elective cesarean. In one group, 35 patients were hydrated with Ringer Lactate while the other group (32 patients) was hydrated with HES. They found that there was not any significant difference in hypotension between both groups, the results of which were not in line with the current study (18).

CONCLUSION

As a final remark, hydroxyethyl starch can be used as an apt serum to hydrate pregnant women. However, further investigation into the complications of drugs on a larger sample size to find a better medication with fewer complications can help prevent many post-operative complications.

CONFLICT OF INTEREST

Authors declare no conflict of interest.

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REFERENCES

- [1] Shibli KU. A survey of anaesthetic techniques used for caesarean section in the UK in 1997. *Int J Obstet Anesth* 2000;9:160-7.
- [2] Miller RD, Cucchiara RP. *Anesthesia*. 5th ed, New York: Churchill Livingstone, 2000:786..
- [3] Andrzej Marciniak. the impact of colloid infusion prior to spinal anesthesia for caesarean section on the condition of newborn_a comparsion of balanced and unbalanced hydroxyl ethyl starch 130/0.4. *anaesth*.2001;23(7):342.
- [4] Cunningham FG, Norman FG, Kenheth JL. William's Obstetrics. 21th ed. Edinburg:Churchill livingstone; 2001:374.
- [5] Reynolds F, Anaesthesia for Caesarean section and neonatal acid-base status: A meta-analysis. *Anaesthesia* 2005;60:636-53.
- [6] Macarthur A, Obstetric anesthesia controversies: vasopressor choice for postspinal hypotension during cesarean delivery. *Int Anesthesiol Clin*. 2007; 45(1): 115-32.
- [7] Kangas-Saarela T. Does ephedrine influence newborn neurobehavioural responses and spectral EEG when used to prevent maternal hypotension during caesarean section? *Acta Anaesthesiol Scand*. 1990; 34(1): 8-16.
- [8] Yokoyama N. Comparison of the effects of colloid and crystalloid solution for volume preloading on maternal hemodynamics and neonatal outcome in spinal anesthesia for cesarean section, Masui. 2004 Sep;53(9):1019-24.
- [9] Riley ET. Editorial I: Spinal anaesthesia for Caesarean delivery: Keep the pressure up and don't spare the vasoconstrictors. *Br J Anaesth* 2004;92:459-61.
- [10] Ueyama .H.Effects of crystalloid and colloid preload on bloodvolume in the parturient undergoing spinal anesthesia for elective cesarean section. *Anesthesiology*. 1999: 1571-6.
- [11] Desalu I. Is ephedrine infusion more effective at preventing hypotension than traditional prehydration during spinal anaesthesia for caesarean section in African parturients? *Int J Obstet Anesth*.2005; 14(4): 294-9.
- [12] carvalho c . maternal,fetal and neonatal consequence of acute hydration during epidural anesthesia for cesarean section. *regional anesthesia* 1993;18:19.
- [13] Madi-Jebara S.Prevention of hypotension after spinal anesthesia for cesarean section: 6% hydroxyethyl starch 130/0.4 (Voluven) versus lactated Ringer's solution A *J Med Liban*. 2008 Oct-Dec;56(4):203-7.
- [14] Bouchnak M.Preloading with HES 130/0.4 versus normal saline solution to prevent hypotension during spinal anaesthesia for elective caesarean section, *Ann Fr Anesth Reanim*. 2012 Jun;31(6):523-7.
- [15] Riesmeier A. Crystalloid/colloid versus crystalloid intravascular volume administration before spinal anesthesia in elderly patients: the influence on cardiac output and stroke volume, *Anesth Analg*. 2009 Feb;108(2):650-4.
- [16] Siddik SM. Hydroxyethylstarch 10% is superior to Ringer's solution for preloading before spinal anesthesia for Cesarean section, *Can J Anaesth*. 2000 Jul;47(7):616-21.
- [17] F.J.Mercier,P. Diemunsch . Hydroxyethyl starch (130/0.4) vs Ringer's lactate preloading before spinal anaesthesia for Caesarean delivery: the randomized, double-blind, multicentre CAESAR trial. *Br. J. Anaesth*. (2014) 113 (3): 459-467.
- [18] Tomoko Yoroze,Hiroshi Morisaki . Comparative effect of 6% hydroxyethyl starch (containing 1% dextrose) and lactated Ringer's solution for cesarean section under spinal anesthesia. *Journal of Anesthesia* August 2002, Volume 16, 203-206.
- [19] Bennasr L,Ben Marzouk S. Prevention of hypotension during spinal anesthesia for elective caesarean section: coloadng with HAE 130/0.4 vs normal saline solution, *Annales Francaises D'anesthesie et de Reanimation*;2014, 33(12):643-647.

ARTICLE

DETERMINING RETELLING OF EVENTS DURING GENERAL ANESTHESIA IN OPEN-HEART SURGERY PATIENTS IN THE HOSPITALS AFFILIATED TO SHIRAZ UNIVERSITY OF MEDICAL SCIENCES

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ABSTRACT

Introduction: patients' awareness of events during anesthesia are considerable complications more pronounced and increasing since the use of intravenous and general anesthesia. Awareness during anesthesia can lead to psychiatric complication and prolongation of post-surgery convalescence. This also has legal implications for the anesthesiologist. Given the importance of anesthesia awareness and the fact that the anesthesiologist are mainly responsible for ensuring sufficient depth of anesthesia and preventing awareness during anesthesia, the present study aimed to determine the incidence of awareness during anesthesia in the patients undergoing open heart surgery.

Methods: One hundred patients older than 15 years of age and undergoing open-heart surgery were selected. They were examined and interviewed 24 hours after surgery to determine retelling of events during general anesthesia. **Results:** In this study, anesthesia awareness was detected in five patients (5%) among which 3 patients (3%) only recalled pain and two patients (2%) evoked auditory incidents during open-heart surgery under general anesthesia. **Conclusion:** anesthesia awareness was detected as 5% in this study according to anesthetics, pump time, hypothermia and the time of stopping injection of anesthetics and operative period. Anesthesia awareness was reported up to 43% in different articles depending on type of operation and changes in the above-mentioned factors.

INTRODUCTION

Anesthesiologists aim to create a state of unconsciousness ensuring that the patients are immune to painful damages during surgery and in the most suitable physiological conditions since the beginning of science of anesthesia [1-3]. Awareness during anesthesia is defined as a case occurring during a preplanned period of general anesthesia in which brain becomes conscious due to some stimuli. Patients usually recall this period of consciousness [4-5]. Anesthesia awareness is an overwhelming and frightening experience causing emotional, sensual and stressful damages [7-6]. The patients with anesthesia awareness have recalled auditory perception, a sense of paralysis, anxiety, despair, fright [8-9], depression, anxiety attacks, sleep disorders, nightmares and feeling of being buried alive [7]. Experiencing pain during anesthesia awareness causes serious psychological impacts on the patients leading to mental disorder in the future. Being conscious and hearing something during surgery make the patient feel weak, paralyzed, distressed, helpless, anxious and frightened of death. In some cases, anesthesia awareness leads to serious problems such as sleep disorder, nightmares and anxiety during days. These effects may be transient or last for weeks or months. Patients are always frightful of what will happen if they undergo another surgery under anesthesia in the future and whether they experience another episode of anesthesia awareness [10]. Inadequate depth of anesthesia and anesthesia machine malfunction [e.g. empty cylinder, N₂O, malfunctioned intravenous pump, disconnected anesthesia circuit] may be involved in induction of sufficient anesthesia. Incidence of anesthesia awareness was noted in some surgeries such as heart surgery and trauma [8].

MATERIALS AND METHODS

This was a prospective study in which 100 patients undergoing open-heart surgery in the hospitals affiliated to Shiraz University of Medical Sciences were interviewed after the surgery when full anesthesia had worn off. The patients were questioned 24 hours after heart surgery when they were fully awake, alert and extubated the anesthetic drugs worn off.

Inclusion criteria: patients undergoing open-heart surgery under anesthesia, patients older than 15 years
 Exclusion criteria: patients younger than 15 years, patients with verbal communication problem, not familiar with Persian Language, the patients who are not extubated due to postoperative complication after 24 to 36 hours and should take more sedatives or analgesics to maintain cardiovascular stability and tolerance endotracheal tube.

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General anesthesia technique was used in this study. Following anesthetic drugs were used in this study.

Premedications: diazepam, midazolam, morphine, fentanyl, sufentanil

Induction of anesthesia: pentothal and pavilion

Preservatives: oxygen, halothane, nitrous oxide

Beginning cardiopulmonary bypass: diazepam + morphine + pavilion

Stopping cardiopulmonary bypass: diazepam + morphine or fentanyl + pavilion

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Cardiopulmonary bypass duration was from 30 minutes to 3 hours and ten minutes. The patients were indirectly asked the following questions:

1. What do you recall before anesthesia?
2. What do you recall immediately after the surgery and anesthesia?
3. Do you recall anything within preoperative-postoperative interval?

Then, the patients were asked the following questions. Their responses were recorded in a specific form.

1. Did you feel pain during the surgery?
2. Did you hear anything during the surgery?
3. Did you recall any dream from the surgery?
4. Do you want to add anything else you have experienced during the surgery?

Positive answers to any of the above questions shows an incidence of anesthesia awareness. It should be noted that 65 patients underwent open-heart surgery in the operating room in Namazi Hospital and 35 patients in Faghihi Heart Hospital among all studies patients (n = 100). These hospitals were affiliated to Shiraz University of Medical Sciences.

RESULTS

In this study, 58 patients were males and 42 patients were females. The patients were between 15 and 75 years old. Weight of the patients varied from 34 kg to 120 kg. Duration of surgery varied from 2 hours to six hours and a half. Cardiopulmonary bypass duration varied from 30 minutes to 3 hours and ten minutes. Shown at [Table 1]

Table 1: Characteristics of the patients in terms of age, weight and duration of operation

	Minimum	Maximum	Mean
Age	15	75minutes	45
Weight	34	120 minutes	77
Duration of surgery	120 minutes	390 minutes	255 minutes
Cardiopulmonary bypass duration	30 minutes	190 minutes	110 minutes

According to classification of The American Society of Anesthesiologists,[Table 2] 15 patient were classified as ASA II, 53 patients as ASA III and 33 patients as ASA IV. None of the patients were classified as ASA I, V and VI.

The surgical operations performed for studied patients were 82 cases of coronary artery bypass graft (CABG), 9 cases of heart valve surgery, 7 corrective surgery of congenital heart defects and 2 cases of transplant coronary artery along with other cardiac surgeries.

Table 2: Distribution of studied patients based on type of open heart surgery and positive cases of anesthesia awareness

	No.	Anesthesia awareness	Awareness%
CABG	82	3	3.65%
heart valve surgery	9	1	11.11%
corrective surgery of congenital heart defects	7	1	14.28
transplant coronary artery	2	-	-
Total	100	5	5%

The results showed [Table 3] that 5 patients (5%) experienced anesthesia awareness among which three cases complained about pain and 2 cases evoked auditory perceptions. No case of dreaming was reported.

Table 3: Distribution of number and awareness% and reminders of pain, hearing and dreaming separately in positive cases

	No.	Percent
Awareness	5	5%
Pain	3	3%
Hearing	2	2%
Dreaming	0	0

DISCUSSION

Anesthesia consciousness varies from dreaming to completely recalling every event during the operation. These incidents are categorized as auditory perception, feelings of pain, tactile sense and dreaming [15]. Three cases of auditory perception, pain and dreaming were examined in this study [12, 15 and 16]. An incidence of anesthesia awareness was detected if the patients recalled at least one of the above cases. Research method consisted of asking some questions from the patients. The patients were interviewed 24 hours after the heart surgery when they were fully awake and alert and anesthetics and sedatives had worn off [16]. In this study, 5 patients experienced anesthesia awareness among which three cases complained about pain and 2 cases recalled hearing something during open heart surgery and general anesthesia. Incidence of anesthesia awareness varied in different studies from 1% to 2% [11]. However, anesthesia awareness was reported higher than that in some cases where inhalation and intravenous drugs were restricted or drug doses were reduced or not administered at all for some reasons. Incidence of anesthesia awareness would be higher than the above figure in open-heart surgery due to the use of cardiopulmonary bypass, hemodilution, hypothermia and not administering inhalation drugs for the pump. Incidence and complications associated with anesthesia awareness were reported as 7% in the studies in the context of cesarean section. This figure was even reported as 17% in some other studies [15-16]. In addition, the incidence of anesthesia awareness varied from 7% to 43% for those patients undergoing cardiac surgery, cesarean section or severe trauma under general anesthesia [11, 14]. Several factors are involved in incidence of anesthesia awareness including physical status (ASA) of the patients before surgery. Accordingly, the incidence of anesthesia awareness varies from 7% to 43% in those patients classified as ASA IV and V [11, 14].

In the present study, only one patient in ASA V, three patients in ASA III and one patients in ASA II experienced anesthesia awareness. Finally, it should be noted that none of the recommendations mentioned in various sources to prevent awareness during general anesthesia can guarantee complete absence of anesthesia awareness. These recommendations are regular and precise examination of anesthesia machine and ventilator before the surgery, use of adequate doses of intravenous drugs at the beginning and end of cardiopulmonary bypass, proper patient care, full and permanent consciousness of the anesthesiologist during the operation[13].

CONCLUSION

According to statistics, anesthesia awareness was reported from 1 to 43% in different operations including caesarean sections, emergency surgeries and open-heart surgery based on operative time, hemodilution when installing the pump and hypothermia, type of anesthetics and the time of stopping these drugs. This figure was reported as 5% in the present study, which seem reasonable depending on terms of the study.

CONFLICT OF INTEREST

Authors declare no conflict of interest.

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REFERENCES

- [1] Ghoneim MM, Block RI, Haffarnan M, Mathews MJ. [2009] Awareness during anesthesia: risk factors, causes and sequelae: a review of reported cases in the literature. *Anesth Analg* 108(2):527-35.
- [2] Liu D, Jenkins SA, Sanderson PM, Watson MO, Leane T, Kruys A, et al. [2009] Monitoring with head-mounted displays: performance and safety in a full-scale simulator and part-task trainer. *Anesth Analg*; 109(4):1135-46.
- [3] Robins K, Lyons G.[2009] Intraoperative awareness during general anesthesia for cesarean delivery. *Anesth Analg*; 109(3):886-890.
- [4] Ali Z, Prabhakar H, Bithal PK, Dash HH.[2009;] A review of perioperative complications during frameless stereotactic surgery: our institutional experience. *J Anesth* 23(3):358-62.
- [5] Kerssens C, Gaither JR, Sebel PS. Preserved memory function during bispectral index-guided anesthesia with sevoflurane for major orthopedic surgery. *Anesthesiology* 2009; 111(3):518-24.
- [6] Forman S, Forman, MD. Awareness during general anesthesia: concepts and controversies. *Seminars in Anesthesia, Perioperative Medicine and Pain*; Elsevier, 2006.
- [7] Lennmarken C, Bildfors K, Enlund G, Samuelsson P, Sandin R. Victims of awareness. *Acta Anaesthesiol Scand* 2002;46(3):229-31.
- [8] Moerman N, Bonke B, Oosting J. [1993] Awareness and recall during general anesthesia: Facts and feelings. *Anesthesiology*;79(3):454-464.
- [9] Cobcroft M, Forsdick C. Awareness under anaesthesia: the patients' point of view. *Anaesth intensive care*21(6):837-843.
- [10] Moerman MD, Bonke B, Osting J.[1993] Awareness and Recall during General Anesthesia: Facts and Feelings.*Anesthesiology* 79: 454-464
- [11] Peter L, Talmago D, Egan and Theodore H. Intravenous opioid anesthetics in R.D.MILLER Anesthesia, 5 th edition, Churchill living stone CO.P.286-287.2000
- [12] Walter S. Nimmo and graham smith. [1989] ,anesthesia,volume 2, 1 st edition, Blackwell scientific publication.P.455,478,505,711.
- [13] Aitknhead R.S, Rushman J. A synopsis of anesthesia 10 th edition, IOP CO.P.174,348,539.1978.

- [14] Ghoneim MM, Block RL. [1992] Learning and consciousness during general anesthesia. *Anesthesiology*. 76: 279-305,2795
- [15] Tunstall ME. [1990] Awareness, cesarean section and isolated forearm technique. *Anesthesia* 45:689
- [16] Wilson j, Turner DJ. [1969] Awareness during cesarean section under general anesthesia, *BRJ anesth*. 1:281-283.

ARTICLE

COMPARING THE CLINICAL PERIODONTAL STATUS IN WOMEN WITH PRETERM AND FULL-TERM DELIVERY- A CASE CONTROL STUDY

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ABSTRACT

Introduction: Several studies considered periodontal disease risk as a factor for preterm delivery. The aim of this study was to investigate a possible link between periodontal diseases as a risk factor for opposite results of pregnancy. **Method:** This case-control study was conducted over three months in the Shiraz Zeynabieh hospital. 88 participants were equally divided into two experimental (n=44) and control (n=44) groups and periodontal examination was performed 1-3 days after delivery. The measured periodontal clinical index was consisted of bleeding index, mass index, plaque index and gingival index and the depth of the platelets were measured in all subjects. Data analysis was conducted by SPSS 11 statistical software and chi-square test. **Findings:** No significant correlation was found between periodontal disease and preterm delivery. Bleeding index in the experimental group was significantly lower than the control group (p=0.01). The plaque index was significantly higher in the experimental group than the control group (p=0.009). The average of other indicators of periodontal and pocket depth in both groups was the same. **Conclusion:** The results of this study indicated no association between periodontal health during pregnancy and improving the results delivery.

INTRODUCTION

The relationship between pregnancy and periodontal inflammation has been known for years. Despite the knowledge about pregnancy and its effects on periodontal tissues and diseases, only recent evidence has shown that periodontal disease inversely associated with public health. Current research suggests that periodontal disease may alter the patient's general health and the inversely affect the health of the fetus and increase the risk of premature birth and low birth weight infants [1]. Preterm delivery or birth before 37 weeks of gestation that its consequences are premature birth or low birth weight infants, is the main discussion subject of developed and developing countries public health [2]. The incidence of preterm delivery in America is ten percent and it is 6.7 percent of all live births in England. The average rate of premature birth rate is 15 per cent in Asia and it is 12 percent in Africa. In total, about 16 percent of newborns in the world are preterm infants [2-4]. Compared with normal-weight newborns, premature infants in preterm deliveries are 40 times more prone to the risk of death in the first 4 weeks after birth and about 2/3 of death in infants in industrialized countries are due to low birth weight and preterm delivery. 5 billion dollars annually is estimated for these infants' health care in America. In addition to the economic, psychological and emotional consequences affecting families with premature infants in preterm deliveries, it can have long-lasting results social health [5]. Approximately 25-50 percent of preterm deliveries with preterm infants take place without expected risk factors [6]. Certain risk factors are including maternal age (less than 17 years and more than 40 years), African-American race, the lower social status, the lack of adequate prenatal care, use of certain drugs, alcohol, tobacco, high blood pressure, localized infections of the urinary tract, diabetes, multiple pregnancies [2-3]. Among the mentioned factors, the most important factor affecting preterm deliveries is infection. In 30-50 percent of premature delivery cases, infection is detected [2]. The researchers, also consider periodontal disease as a source of infection, on the other hand, some studies have shown that mothers of premature and low birth weight babies significantly have the loss of clinical attachment than mothers with normal weight [1]. According to the findings seems that if mothers, obstetricians and gynecologists and dentists have sufficient knowledge and adequate information about the relationship between periodontal disease and preterm delivery, they can take effective steps to reduce the rate of Preterm delivery stop. Following this reduction, of course will improve physical health of mothers, infants and families and ultimately spiritual psychological health. The aim of this study by using periodontal index was to understand the relationship between maternal periodontal diseases with an incidence of preterm deliveries. The emphasis on proper oral and dental hygiene during pregnancy and considerations for the prevention of gum disease during this period is inevitable. If it is determined that the presence of periodontal disease during pregnancy can act as a risk factor for preterm delivery, the need to control oral health (preventive actions) in women of childbearing age and during pregnancy is more specific and stronger.

KEY WORDS

Periodontal, preterm delivery, full term delivery

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MATERIALS AND METHODS

This case-control study was conducted on 44 participants in experimental group and 44 participants in the control group in the Shiraz Zeynabieh hospital. Before starting, their verbal consent to participate in the study was drawn. The women participating in this study aged between 17-35 years. The control group consisted of women who had taken their delivery after 37 weeks of pregnancy and the experimental group consisted of women who had labor before 37 weeks of gestation or spontaneous and premature rupture of membranes. Gestational age was determined by last menstrual date. At the end, health directives and guidelines for the treatment of periodontal problems were given to studied pregnant women. The study population had no risk factors for preterm delivery, including: 1. consumption of alcohol, 2. tobacco consumption, 3. previous preterm delivery record, 4. record of 2 or more abortions, 5. lack of pregnancy care exposure, 6. younger than 17 or older than 35 years, 7. urinary tract infection is not treated or treated two months before the delivery, 8. history of sexually transmitted diseases, 9. systemic diseases such as diabetes or autoimmune disease, 10. corticosteroid use, 11. eklmps and preeclampsia. Given the importance of urinary tract infection as a known risk factor for preterm delivery, urine cultures were immediately performed for all subjects after delivery and in case of positive culture, they were excluded. Periodontal examinations were done lying or sitting on a hospital bed and took. Periodontal examinations were done by a dentist in a standing position and by using the single head lights. The following periodontal examinations were conducted on the subjects.

1. Measure bleeding index

In this index in addition to time factor (30-20 seconds after entering the probe Williams) the extent of bleeding is considered. Based on the above considerations it can be expressed as 5 degrees.

Grading	Description
0	The absence of bleeding
1	blood spots only and about 20 to 30 seconds after the probe off
2	Existence of several blood spots or a thin line of blood
3	Fast filling of the interdental triangle with blood after probe
4	Immediate bleeding in a large amount

2. Measure plaque index

By using this index and the plaque revealer pills (Erythrosin) facial and lingual surfaces plaque on the teeth were examined and graded as follows.

Grading	Description
0	The absence of plaque
1	There are scattered plaque around the cervical margin of dental
2	There is a thin and persistent layer
3	There is a strip of more than 1 mm thick plaque that covers less than 1/3 of crown
4	There are plaques with more than 1/3 and less than 2/3 dental crowns coverage
5	Plaque presence so that 2/3 or all of the crown is covered.

3. Measurement gingival index:

Gingival status in terms of Inflammation based the above mentioned index was investigated in the four areas distobuccal, buccal, mesiobuccal and lingual and was graded as follows:

Grading	Description
0	Normal gingival
1	Mild inflammation
2	Moderate inflammation
3	Severe inflammation with redness

4. **Measurement of the depth of the plate:** was performed by the Williams probe from gingival margin to end of the pocket in six points for each tooth.

5. **Mass Index measurement:** the amount of dental calculus based on the grading below was investigated in buccal and lingual surfaces.

Grading	Description
0	Absence of calculus

1	Calculus less than 1mm
2	The average amount of calculus
3	Too much calculus

It should be noted that the bleeding index measurement was performed for all teeth, but other indicators and measurement of depth of plaque were performed on six teeth of RAMFJORD. Nowadays RAMFJORD TEETH as a limited number of teeth that reliably represents the state of the teeth, applied in various studies. In this study also the number of extracted teeth was revealed. In this study demographic characteristics included: age, education, occupation, number of previous pregnancies, number of children and birth weight at delivery.

RESULTS

This study was performed over three months in the Shiraz Zeynabieh hospital. 2 study groups were consisted of 44 patients in experimental and 44 patients in control groups. The experimental group consisted of women who give birth earlier than 37 weeks and the control group was consisted of full-term pregnancies after 37 weeks of gestation. The age range was 17-35 years. The average age of mothers in the control group was 25 years and 24 years for the experimental group, there is no significant difference between the two groups ($p=0.786$). Also the percentage of different age groups showed that the highest percentage was the age group of 24-20 years. Based on Chi square no relationship has been seen between age groups and preterm delivery ($p=0.502$). According to chi-square analysis the likelihood of women preterm delivery at first delivery was more ($p=0.008$). Chi-square test results showed a statistically significant difference between the two groups in terms of the number of extracted teeth ($p=0.949$). In [Table 1] average of various periodontal indices and the average depth of the plaque are shown.

Table 1: Comparison of indicators of periodontal pocket depth in the two study groups

Characteristic of periodontal index	TB	PB	P-VALUE
Bleeding index	0.84+ 0.56	0.56+ 0.43	0.010
Gingival index	1.07+ 0.57	1.02+ 0.30	0.593
Calculus index	0.57+ 0.40	0.59+ 0.34	0.724
Plaque index	2.18+ 0.73	2.63+ 0.84	0.009
The depth of pocket	2.10+ 0.36	2.19+ 0.45	0.304

In this study inverse relationship between bleeding index and preterm delivery was found ($p = 0.010$). On the other hand the plaque index was significantly higher in the experimental group compared to the control group ($p = 0.009$). Also no significant differences were observed in probing depth, gingival index and mass index in the two groups. Also mean bleeding index in the two groups showed [Table 2] that the mean of the experimental group bleeding was more the control group ($p<0.05$).

Table 2: Average bleeding index in the two study groups based on the number of hemorrhagics

Characteristic	TB	PB	P-VALUE
Average	0.36+ 0.18	0.27+ 0.18	0.033

DISCUSSION

This study is as; case-control does not show any association between periodontal disease and an increased risk of preterm delivery. Also a reduction was seen in bleeding in the TB Group compared to PB ($p = 0.01$). Devenport et al. (2002) in their study on 236 patients and 507 control subjects found that the probability PLBW was reduced by increasing the depth of the plate (7). Also Moore in 2004 in a prospective study conducted on 3738 women did not find any link between periodontal disease and preterm birth or low birth weight (8). But other studies, including studies of Offenbacher (9), Lopez (4), Hasegawa (10), Mokeem (3) and Louro (11) demonstrate a positive relationship between periodontal

disease and preterm delivery alone or with birth low birth weight (LBW). It seems that the main reason for the different results this study from the most of the studies is the difference in how to do research. Following items defines the difference with different studies. 1. The number of subjects 2. range and average of the patients' age, 3. genetic and racial characteristics of the subjects, 4. the impact of environmental factors and socioeconomic status, 5. type of study (prospective or case control), 6. time of analyzing the periodontal status.

The average age at study in PB and TB are respectively 24.9 and 25.2 years that compared with an average age of mothers in Mokeem's (3) study are respectively 35/39 and 34/63. This indicates that the studied population is younger. Considering that with aging the risk of periodontal disease is also increased in people and chronic periodontal disease onset is usually 30-35 years is for adults, it is possible that the younger population in this study due to lower age generally show a lower percentage of periodontal disease. Due to the fact that pregnancy itself does not cause gingivitis and pocket depth rise, but hormonal changes resulting aggravate tissue reactions to the plate As a result, the underlying periodontal disease (pre-pregnancy) is necessary to tighten or symptoms of periodontal disease during pregnancy. The aim of this study was to investigate various aspects of periodontal health status of the subjects. For convenience and comfort of examined participant, the determining CLINICAL ATTACHMENT LEVELE unlike most studies has not been performed. Due to the shallow depth of pocket in majority of the participants, it becomes clear that the ATTACHMENT LOSS level in the examined participant has been slight.

Mokeem to facilitate the study did not use CAL and instead by CPITN examined the periodontal status. Randai et al. (9) also believe that CAL periodontal disease and loss of connections made in the past is not indicative of active disease. He states that the investigation the envelope for providing the space required for bacteria is more important. The study group consisted of women with preterm labor before 37 weeks and must be separated from birth weight less than 2500 grams. In this study the selection of experimental and control groups is based on gestational age at childbirth. Whereas in most studies the experimental group included women who delivered before 37 weeks of gestation or had LBW infants and comparing the results with the results of these studies can lead to error (3-5, 11 -12). The average weight of babies in the control group in this study is similar to Mokeem's study, but the weight of infants in experimental group in this study is slightly greater than the study mentioned (3). In this study both groups showed symptoms of mild gingival inflammation (gingivitis) and 40.9% of the control group and 43.2% of the experimental group showed signs of moderate gingivitis. If moderate plaque index status of plaque is present in both groups, the participants in this study had relatively good health despite relatively low socio-economic status.

CONCLUSION

In this study no association between maternal periodontal disease and PB was received. It seems that to achieve more conclusive results, wider epidemiological studies and more samples are needed in different races.

CONFLICT OF INTEREST

Authors declare no conflict of interest.

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REFERENCES

- [1] Joan Otomo – Corgel . Periodontal Therapy in the Female Patient (Puberty , Menses , Pregnancy , and Menopause) . In : Carranza's Clinical Periodonotology. 9th edition W.B.Saunders co,2002.
- [2] Tim McGaw: Periodontal Disease and preterm Delivery of low – Birth – weight Infants. J Can Dent Assoc 2002 ; 68(3) : 165-9
- [3] S.A. Mokeem, G.N. Molla , T.S. Al – jewair : The Prevalence and Relationship Between Periodontal Disease and pre – Term Low Birth Weight Infants at King Khalid University Hospital in Riyadh , Saudi Arabia. J Contemp Dent Pract 2004 May ; (5) 2:040-056.
- [4] NJ Lopez , PC. Smit , J Gutierrez. [2002] Higher Risk of preterm Birth and Low Birth Weight in Woman With Periodontal Disease . J Dent Res 8191 : 58 – 63.
- [5] Steven Offenbacher , Vern Katz , Gregory Fertik and et : Periodontal Infection as a possible Risk Faktor for preterm Low Birth Weigh. J Periodontal 1996; 67:1103-1113.
- [6] Ray C. Williams and David paquette: Periodontitis as a Risk for Systemic Disease. In : Clinical Periodontology and Implant Dentistry. 4th edition.Blackwell Munksgaard.2003.
- [7] E.S. Davenport , C.E.C.S. Williams , J.A.C. Sterne and et al : Maternal Periodontal Disease and preterm Low Birth Weight: Case – Control study . J Dent Res 2002; 80(5) : 313-18.

- [8] S Moore , M Ide py. Coward and et al : A prospective study to investigate the relationship between Periodontal disease and adverse pregnancy outcome . British Dental Journal 2004; 197: 251-58.
- [9] Radnai M, Gorzo I, Nagy E and et al.[2004] A possible association between preterm birth and early Periodontitis . Pilot Study . J Clin Periodontal ; 31 : 736-741.
- [10] Kozue Hasegawa , Yasushi Furuichi , Akihiro Shimotsu and et al. [2003]Association Between Systemic Status , Periodontal Status , Serum Cytokine Levels , and Delivery Outcomes in pregnant Women with a Diagnosis of Threatened Premature Labor. J Periodontal ; 74: 1764-1770.
- [11] PM Louro , HH Fiori , paulo Louro F et al. [2001] Periodontal disease in pregnancy and Low Birth Weigh. J Pediatr 77(1) : 23 – 28.
- [12] Dasanayake AP:[1998] Poor Periodontal health of the pregnant women as a risk factor for low birth weight. Ann Periodontal 3(1) : 206-212.

ARTICLE

HUMAN RESOURCES MANAGEMENT IN PROJECT-BASED ORGANIZATIONS ACTIVE IN THE CONSTRUCTION INDUSTRY

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ABSTRACT

Today projects are widely implemented in all organizations and few organizations can be found that is not in some way involved in implementing a project. Projects as a means of change are defined as a temporary organization and different resources are organized in them in the new form to achieve certain goals within the constraints of time, cost and performance. Projects as temporary organizations operate in a context that this context has synergistic effect and inhibitory effect on the actions, resources and relationships of temporary organization. A major part of the project management literature is based on the assumption that temporary organizations (projects) are formed within the boundaries of permanent and fixed organizations and they are expected to have longer life than the life of each one their projects. In this article in a broader framework we will examine human resources management procedures in project-based organizations and a general category of human resources management models will be presented. Also in this article the main pillars of research-based organizations and the challenges of human resources management in these organizations have been studied and a prioritization of these challenges will be presented.

INTRODUCTION

Infection In the world of project-based organizations, this environmental platform is called the parent organization of project that is considered one of the three groups having impact on project success. It is the parent organization in which the projects are formed and without it, there is no possibility of defining projects in many cases [1]. In the past decades a fundamental shift is seen in how professionals work. Works have become more sophisticated and have been directed towards being knowledge-oriented and as a result, employees prefer to participate at work groups instead of doing individual work. Most analysts believe that one of the main drivers to develop work groups is availability of complex products and systems that force organizations to develop their own strategies in order to take advantage of the advantages of applying integrated solutions, system integration and project business. The important point in this shift is an approach to being project-based that force organizations to simultaneously have integrated look at temporary and permanent organizations to be able to carry out economic activities at playing a role in work between the temporary (project) and permanent (functional) organizations that is the origin of the development and creation of project-based organizations in today's economy.

Since the focus of this research is on project-based organizations, it is necessary first to provide a clear description of these organizations. Generally, project is seen in the common definitions in the form of duty, temporary, complex and unique duty individually or collectively; but in today's literature project is considered as a particular type of a temporary organization. The project, therefore, is an organization of smaller organizations with the following characteristics:

- has an unusual and unique process that results in the unusual production and generally includes uncertain technological tasks.
- has a predetermined time limit. For this purpose that work implies a period of time and thus the time pressure.
- has performance evaluating measurements such as time, cost, quality, value creation and profit
- In terms of activities, roles and internal dependencies are complex and uncertain that requires conscious organization.
- has dynamic and organic structure with unofficial behavior and in terms of specialty has flat and horizontal structure and serves as decentralized work teams.

Tend to highlight the projects and project-based work has increased in recent years. The reason of it is organizations' need to take advantage of appropriate structures to respond to highly privatized and diverse demand, especially for organizations in the creative, cultural and developed technology industries as well as professional consultations industries. Another reason is that the interest of organizations in all sectors of industries to carry out project activities, in spite of main size or operational performance of their production activities, has been increased. Many researchers differentiate organizations that most of their activities are projects or emphasize project aspect as well as organizations with operational and structural dimensions and normal processes are dominant in it and the projects are as the side activities to support the organization's main activities [3].

KEY WORDS

Human resources management, project-based organizations, human resources functions, knowledge absorption capacity.

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PREVIOUS STUDIES

Turner and Keegan define project-based organizations as "an organization in which major produced products and services are contrary to the default designed plan for customers". This inevitably puts the organization in a project-based class because products have been personalized according to customer needs. However, management still requires the adoption of project-based solutions as strategic choices. According to Garis, if an organization considers itself a project-based one and its policies, procedures and culture are according to this state, it is considered a project-based one.

This workspace has some characteristics that make it different from traditional work environments of large enterprises with classical management, these characteristics include the following:

1. The temporary work processes: Project-based organizations use temporary structures (projects and programs) to get things done. Whenever a new project or program or is initiated or prior project is ended, human resources management settings of parent organization is changed. Therefore, organizations need not only human resources management procedures in the organization, but also need the application of specific procedures for temporary organization or the project. This involves the need to develop new human resources management procedures such as assignment of force to the projects, estimating, developing and rewarding to them about the duties of a project, discharging them after the end of the project and the relationship between project tasks and resume of individuals.

2. Dynamic work environment: The temporary nature of things leads to the creation of dynamic range and work context that may affect stress and motives of workers of project and creates the need to develop strategies by managers to adapt to stress. In addition, the number and size of projects under construction may constantly change and makes it difficult to predict future required resources.

3. Roles and resources requirements for project portfolio: A project-based organizations at any time undertakes a specific portfolio of internal and external projects. One person may be working simultaneously in several projects and even with several different roles. Such conditions can lead to role inconsistencies role at the individual level. Organizations also need human resources management procedures to assign individuals to several projects and programs and facilitate common requirements across projects and plans as much as possible.

4. Specific management paradigms: An ideal project organization has a special management culture which has attributes such as employee empowerment, teamwork and process-based work, discrete and continuous organizational changes focus on customer and networking with suppliers and customers. Therefore the project employees require specific competencies and skills in order to be able to operate simultaneously with each other in a project. So project organizations may need training procedures and development of employee so that employees are able to work in the project environment which in turn requires special adaptation to human resources management procedures in this field in accordance with used management paradigms. Therefore the project-based organizations need the adoption of human resources management which supports methods of project operation.

Studies related to the projects mainly have focused on the study of a project regardless of its executive field. Angola (2003) in a comparative case study comparing two different projects, discussed different performance reasons of them. He first criticized the theories presented with the dominant view of single project and states that the context in which the project is run has a major impact on the performance of the project. Several studies consider projects as temporary organizations that are run in a practical context, namely the permanent organization. Permanent organizations formed to carry out common and repetitive tasks, are supportive with lots of applications involved in the implementation of a series of the projects and possess key resources and knowledge (Galbraith, 1994) and are led to economies of scale. In a given situation, any one of these two types of organizations can be stronger than others, and finally, a spectrum be formed that at the one end of it is main overcoming with the permanent organization and at the other end is overcoming with the temporary organizations (project). In the middle region of this spectrum, for example, there are consulting firms and contractors of construction projects that are project-based organizations and can have project management office or the office of plan management [4].

Turner and colleagues (2008) investigated human resources management in project-based organizations with a focus on employee health and ethical behavior modification. In this study, in the broader context of human resources management practices in project-based organizations they investigated employee health. Project-based organizations through temporary work processes provide required products and services for customer. This results in a dynamic work environment that through fluctuations of work intensity, uncertain requirements and the need for multiple roles can cause additional work pressure on employees. This pressure may lead to issues concerning health and ethical behavior of employees that requires management. Human resources management traditionally plays two roles, first it provides the necessary support to the management and proper people for the organization to cope with things, and also it provides necessary support of employee and considers their health important. It has been observed that in project-based organizations the role of support of the management is the dominant role that these systems do not consider the health of employees very important. The need for profitability and response to

customer demand usually takes priority over the health of employees. However, some of the studied organizations have selected human resources management procedures to protect employees' health. In addition, providing job promotion opportunities is equally important for the organization and for the employees and they refer to it [3].

Pupaiton and Singtay (2013) investigated moderating effect of human resources management practices in relation between knowledge absorption capacity and performance of the project in project-based companies. This study in response to recent requests for research on human resources management in project management examines relationships between human resources management practices, knowledge absorption capacity of the project team and the project function in the project-based companies. This study based on survey data show that human resources management practices modify knowledge absorption capacity of the project team on project performance, particularly in the field of long-term performance potential in the project. In addition, human resources management practices are realized by understanding the absorption capacity of the project team by a project team that is an extra dimension of the project team knowledge absorption capacity in order to achieve short-term performance of the project. This study clarifies the various roles of human resources management practices in a project and shows that human resources management practices not only facilitate knowledge management of current projects and future projects but strengthens the relationship between knowledge of a project-based team and long-term performance of project [5].

Sabirkhan and Rashid (2014) examined performances and success of human resources management with a focus on Islamic countries. In this study, the relationship between human resources performances and the success of projects in project-based organizations in Pakistan has been simulated. This study makes direct modifying hypotheses for the relationship between the four selected functions of human resources (recruitment and selection of employee, employee development and training, employee performance evaluation and salary system of employees), project success and Islamic work ethics at project-based organizations in Pakistan [6].

Mohaqqar et al. (2013) examined and identified the parent organization functions as a case study of project-based organizations active in the construction industry. Based on the case analyses, seven main functions for project-based organizations have been identified. By specifying these functions, project-based organizations should move to develop the necessary capabilities to perform them better and formulate and implement policies and strategies in this direction [4].

Asili (2013) strategically analyzed structural model and the role of human resources management in project-based organizations. In this article it was tried to scientifically analyze the structure and role of human resources in the project-based organizations with an new approach and with explaining the topic literature in the fields and project-based organizations, key roles of actors in the four aspects of human resources, structure of human resources in these organizations. The research also hints suggestions and strategies for use of human resources management in similar organizations in the country [2].

Golabchi et al. examined the effect of human resources management on efficiency in project-based organizations. In this study, they have tried to examine management texts to find out importance of human resources management in increased efficiency of project-based organizations. This article provides a logical research about the importance of human resources management in efficiency of project-based organizations that the aim of it is the systematic study and investigating the effects of human resources management as one of the areas affecting the efficiency of the organization. In order to achieve this objective, two analytical and statistical stages are offered: In the analytic stage, the need to improve human resources management has been studied and in the statistical method, the carried out survey and the obtained results are discussed using graphical charts. This systematic approach can result in providing justifiable and rational guidelines, and practically is used for the management and improvement of the efficiency of human resources and organization [7].

Shenhar et al (1997) provided an important distinction between performance evaluation of project at short and long term. Project performance in the short term includes the completion and efficiency of the project and its commercial success. In contrast, project performance in the long term refers to created potential by project for future projects. Short-term and long-term aspects of project are similar to nature of continuous development projects of product (Wheelwright and Clark, 1992). Thus, company maintains most of the nuclear members of formerly successful project and passes them on future projects. Rashnovadi and kahzadian (2012) examined human resources management in project-based organizations. In their article, they provided research in the field of human resources management and human resources management challenges in project-based organizations and matrix of excellence in project oriented organizations [8].

DISCUSSION

Man as focus in topics of organizational behavior and human resources management has a special significance in new management. Project human resources management includes the processes are necessary to achieve the most effective use of people involved in the project which it should be considered as the main process of a project-based organization that causes impact on the method of absorption and utilization of human resources and how to perceive business relations by them. Human resources issues can be analyzed on two levels of strategic human resources management and operational management of the human resources, operational management of human resources focuses on functional issues such as employee absorption plans as procedures before entering of the workforce to the organization, performance management, compensation, development and employee relations as processes during work in the organization. Strategic human resources management follows labor efficiency, increased labor force creativity and innovation, creation and enhancing employee commitment, increasing better services from the customer perspective, the improvement of the labor force role in developing and executing organizational strategies as a part of their changing roles. In general, human resources management models can be classified in four categories as following:

1. Scientific management: In this model, human needs are limited to material. Therefore, with meeting the material requirements employee should respect what the director says. There is no wonder that with this model as axis easily skilled and creative workforce with only a small amount of additional salary goes from a company to another company.
2. Management based on human relationships: This model considers the feelings of humans as well. Therefore, man in this model is not only with the stomach but also has heart. But this management method is often a patronizing-father one. When a conflict, the director claims has better understanding and knows goodness of his employee better than them. Finally, this model is not perfect, like the first model.
3. Human resources-based management: humans have talent as well. In this model human being has the abdomen, heart and brain. The director tries to provide what is needed to develop the talent of its employees. But this management technique is not institutionalized with satisfaction (although in the short term is better than the first two models) because still employees are not seen as perfect humans.
4. Management according to principles: human beings in this view have the abdomen, heart, brain and soul. In this view, employees want to be informed of the mission of project and they get committed to pass the way.

Human resources management is management of employee. The proper functioning of an organization requires making sure of human resources availability that can have a beneficial function in order to achieve organizational goals. According to economic changes and local and global improvements, many changes occur that are effective on a wide range of aspects of human resources [8].

In a study entitled as Global HR Challenges: Yesterday, Today and tomorrow, by the WFPMA organization and by Paris Waterhouse Cooper, several problems have been noted in the field of human resources management. In a study conducted by Golabchi et al., the most important challenges of human resources management are shown in [Table 1]:

Table 1. Prioritizing human resource management challenges [9]

% companies	Challenges	row
48%	Change management	1
35%	Leadership Development	2
27%	The effectiveness of human resources	3
25%	Organizational effectiveness	4
24%	Reward and penalty system	5
24%	Employment and the availability of local skilled labor	6
20%	Succession planning	7
19%	Training and Development	8
16%	Retention of staff	9
13%	Cost of Health and Welfare	10

There are different definitions for project-based organizations. In this organization, project structure is the dominant structure. For example, Habdy defines these organizations in this way that in them, the project is the basic unit of production, innovation and competitiveness in which there is no formal functional coordination across lines of project. Fourth Edition of PMBOK of organizational structure in terms of the level of discretion of project manager defined as follows: functional, project and matrix. Functional structure is the most common form of organization. It includes the expertise areas in various functional

areas including: accounting, marketing and manufacturing and projects generally occur within a single segment and if the data or project work is required from other sectors, the needed request is informed head of section to pass to head of another section. Otherwise, communication is within the project, team members would complete project in addition to the usual department works. On the other hand in the project structure, the company is organized on a project basis. Project manager, controls project, employee is dedicated to the project and reports are given to the project manager. Team members perform only project works and when the project ends, the employees do not return to a certain section, they should be work on another project or start another work with another employer, in general, communication occurs only within the project. In a matrix organization, it is attempted to maximize the available strengths of both project and functional structures. Team members report project manager and functional manager and are associated with both their heads and team members do project work alongside the routine works of the department [9].

The main components required for a project-based organization to develop a complete system are shown in Figure 1 are explained as follows:

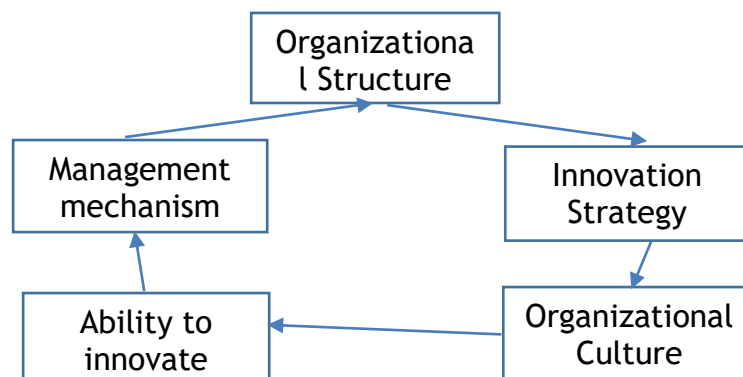


Fig: 1. The main elements of project-based [10]

As seen in this figure, a research-based organization is made up of five main pillars:

- **Organizational Culture:** People are encouraged to experience anything new and tolerate failure to be not afraid of the risks and be encouraged in innovation. Every organizational culture is used for the operation and management of it so project-based organizations should have innovative organizational culture to have innovative performance and management so that employees' motivation and initiative is resulted.
- **Ability to innovation:** these organizations should have a good power of innovation and innovation management capability, because they need to innovate for survival and development, and it is why it is the most effective initiative and efficient way to survival and development.
- **Management mechanism:** If we want to encourage people to have initiative and creativity, management mechanism and style of the organizations or companies should be based on management by project. They should act based on teamwork, self-management and dynamics at project and operational work, therefore, the management system and style of these organizations should be based on self-management so that individuals of these organizations or companies are encouraged in the innovation.
- **Organizational structure:** Although these organizations have operational or routine tasks and projects or individual tasks, they do their everyday operations as a project and adjust their project management methods with all necessary works for survival and development in the competition and improve their innovation capabilities and competencies.
- **Innovation strategies:** organizational culture of these organizations or companies should have shared values in innovations and should emphasize the importance of innovation. The core of the culture of these organizations should encourage individuals to gain new experiences with motivations to increase innovation [10].

Finally, seven main functions were identified for project-based organizations that are introduced as following. Figure 2 shows these functions:

Monitoring
and

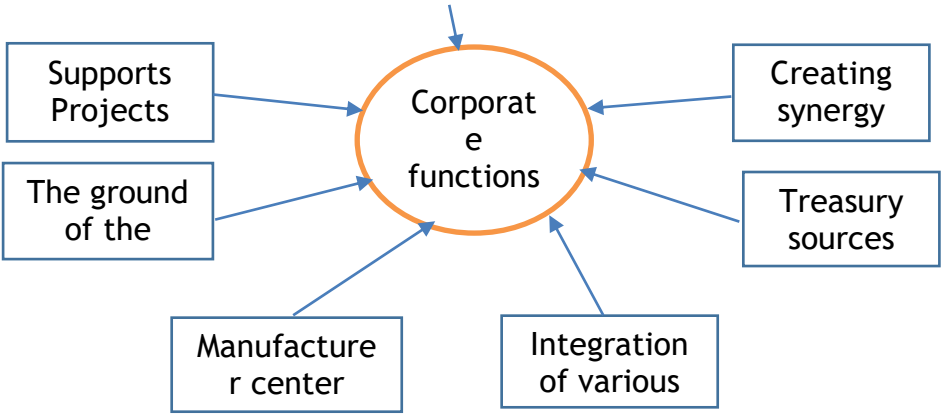


Fig. 2: Karkrdhay project-based parent organization [4]

In comparison with functional and matrix organizations, project-based organizations has been introduced an organizational form to manage the growing complexities of the product, rapid changes in the market, innovation and technological uncertainty especially if systems and industrial products have high value and complexity or advanced and high-tech capital goods are targeted. Companies often to enhance flexibility, adaptation and customer orientation turn to the project organization. At project-based organizations, project is the main unit of production, innovation and competitiveness. Also in this type of organization, project is the main mechanism for coordination and integration of organizational functions of a company and the whole organization is formed around various projects in which people with different skills come together to produce innovative products and services at limited intervals of time [4].

Putting people at the activity center as a designer and manufacturer of development directs us to pay attention to four factors reinforcing improvement of human resources, factors that release spirit of getting successful that there is potentially in each one of us. These four reinforcing factors that each one has integration and interdependence with each other are employment, environment, health and education. These factors are shown in [Fig.3]:

Strengthening factors of improvement of human resources			
Education	Health	Environment	Occupation

Figure 3 - Factors to strengthen the improvement of human resources [9]

In literature of project management, human resources management practices have favorable effects on the performance of the project (Heumann et al. (2007)). Pinto and Slevin (1988), argue that human resources is an important factor in the success of the project, while other researchers such as Blavet and Gavuriao (2004), Fabi and Paterson (1992) and Heumann et al (2007) in their analysis discovered the effect of human resources management on project operations in order to facilitate access to intended project performance. Project-based companies use temporary organizational structures for the implementation of their own work through the projects. In this regard, scientists such as Souderland and Burdine (2006) and Turner et al (2008) argue that human resources management practices adopted by the POC should be applied in a certain form at interim approved work processes Therefore, human resources management practices in the POC may be perfectly different from available practices in the classical model of management due to designing international human resources management practices among individual projects [5].

Researchers of strategic human resources management have continually stressed the importance of reviewing performances and multiple ways rather than focusing on a specific action and the role of these methods in human resources development of an organization in order to increase business competitive advantage (Barney and Wright (1998). Moreover, Delry and Doty (1996) suggest that: SHRM "The initial assumption is that the organization that has adopted a specific strategy needs human resources management practices different from organizations that use alternative strategies". It has been expressed with referring to the significance of certain human resources management practices in a certain working environment. The impact of performance of human resources management practices can be more effective when implemented in the right place or fit the project environment. Accordingly in this research, human resources management practices that are considered include education, rewards and career path development that have been identified by Turner et al (2008) and other ways have been added to it to increase opportunities for project team members (for example, partnerships and independence of project team). These procedures are used to improve project performance [6].

Experimental studies show that human resources management practices are positively correlated with project performance in both short-term and long-term forms. For example, for short-term performance, Chen and Huang (2009) found that human resources management practices with increased acquisition capacity, knowledge sharing and planning in Taiwanese companies can have a positive impact on innovation performance. Chuang et al (2010) also found that human resources management practices contribute to the process of acquiring knowledge and sharing it and have important role in creating resources and capabilities of knowledge. According to long-term performance, Swart and Kani (2010) by a multiple case study identified human resources management practices to determine the rate which education unit is supported. In addition, human resources management practices makes a clearer vision of the future that may lead to providing better support and as a result better performance of the project. Overall, human resources management practices in order to achieve the project performance in both the short and long term cases help project teams so much [6].

RESULTS

Since the treatment for project-based organizations, due to the use of temporary methods of work processes in the form of projects is different from the traditional organizations with classical management, accepted approaches in the field of human resources management must support this unique structure. Therefore, taking into account the temporary nature of projects in project-based organizations, functions and approaches of human resources management must evolve in such a way that act in line with the objectives, strategies of organization and operational processes of organization. Also the specific functions and procedures should be implemented for satisfaction of employee in the workplace. Ignoring these considerations may affect employees' efficiency and effectiveness.

REFERENCES

- [1] Mahmoud Golabchi, Saeid Yousefi, Mona Forouzanfar (2012), "The Effect of organizational factors on performance of human resources of project-based organizations in developing countries", Third International Conference on Construction Industry, Construction Industry Development Research Institute, Tehran, Iran , 18-19 December.
- [2] Gholamrza Asili (2013), "Strategic Analysis of the structural model and the role of human resources management in project-based organizations" Industrial Technology Development Journal, Issue 22, Autumn and Winter, pp. 33-44
- [3] Rodney Turner, Martina Huemann, Anne Keegan.(2008), "Human resources management in the project-based organization: Employee well-being and ethical treatment", International Journal of Project Management, Vol 26, pp 577-585
- [4] Ali Mohaqar, Ahmad Jafar-Nejad Mahmoud Golabchi, Jabbarzadeh Yunes. (2013), "identifying the functions of the parent organization: Case Study: Project-based organizations active in the construction industry", Industrial Management, Tehran University, Management School, Volume 5, Number 2, Fall and winter, pp. 141-154.
- [5] Sujinda Popaitoon, Sununta Siengthai.(2013), "The moderating effect of human resources management practices on the relationship between knowledge absorptive capacity and project performance in project-based companies", International Journal of Project Management, vol 32, pp 908-920.
- [6] Adeel sabir khan, Farooq Rasheed. (2014), "Human resources management practices and project success,a moderating role of Islamic Work Ethics in Pakistani project-based organizations, International Journal of Project Management,Vol 33, pp 435-445.
- [7] Mahmoud Golabchi, Saeid Yousefi, Mona Forouzanfar (2012), "The importance of human resources management in efficiency of project-based organizations", Third International Conference on Construction Industry, Construction Industry Development Research Institute, Tehran, Iran , 18-19 December.
- [8] Ali Rashnovadi, Saeid Kahzadian (2012), "Human resources Management in project-based organizations", Second National Conference on Construction Engineering and Management, Amirkabir University of Technology, Faculty of Bandar Abbas, Bandar Abbas, Iran, May 13-14.
- [9] Mahmoud Golabchi, Saeid Yousefi, Mona Forouzanfar (2012), "The effect of education on human resources development of project-based organizations", Third International Conference on Construction Industry, Construction Industry Development Research Institute, Tehran, Iran , 18-19 December.
- [10] Mahmoud Golabchi, Saeid Yousefi, Mona Forouzanfar (2012), "Study of components of project-based organizations ", Third International Conference on Construction Industry, Construction Industry Development Research Institute, Tehran, Iran , 18-19 December.

ARTICLE

TENSION SPLINE SOLUTIONS FOR FOURTH ORDER SINGULARLY PERTURBED BOUNDARY-VALUE PROBLEMS

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ABSTRACT

We use tension spline to develop numerical methods for the solution singularly perturbed boundary-value problems. The proposed methods are accurate for solution of fourth order boundary-value problems. End conditions of the spline are derived. Two examples are considered for the numerical illustration. However, it is observed that our approach produce better numerical solutions in the sense that $\max |e_i|$ is minimum.

INTRODUCTION

We consider fourth-order boundary value problem of type:

$$\varepsilon u^{(4)}(x) = f(x, u), \quad x \in [a, b] \quad (1)$$

with boundary conditions

$$u(a) = \sigma_1, y(b) = \sigma_2, y^{(2)}(a) = \sigma_3, y^{(2)}(b) = \sigma_4 \quad (2)$$

where σ_i for $i=1,2,3,4$ are finite real constants and the functions $u(x)$ and $f(x, u)$ are continuous on $[a, b]$ and ε is a parameter such that $0 < \varepsilon < 1$.

Several methods such as an asymptotic finite element method, quintic B-spline method, initial value techniques, differential transform method, variable mesh difference methods, fourth-order spline method, Non-polynomial sextic spline and tension splines, in solving singularly perturbed boundary-value problems has been of considerable concern and is well covered in papers see [1]-[10]. Akram et al. [11]-[12] used septic spline and quintic spline for the solution of fourth order singularly perturbed boundary value problem.

Following the spline functions proposed in this paper have the form $T_9 = \text{span}\{1, x, x^2, x^3, x^4, x^5, x^6, x^7, \cos(kx), \sin(kx)\}$ where k is the frequency of the trigonometric part of the spline functions. Thus in each subinterval $x_i \leq x \leq x_{i+1}$ we have

$$\text{span}\{1, x, x^2, x^3, x^4, x^5, x^6, x^7, x^8, x^9\}, \text{ (When } k \rightarrow 0 \text{)}$$

In this paper, we use tension spline approximation to develop a family of new numerical methods to obtain smooth approximations to the solution of singularly perturbed boundary-value problems. In Section 2, the new tension spline methods are developed for solving Eq. (1) along with boundary condition Eq. (2). and also development of the boundary formulas. Section 3, tension spline solution of (1) and (2) is determined and in section 4, numerical experiment, discussion are given.

NUMERICAL METHODS

To develop the spline approximation to the boundary-value problem Eqs. (1)-(2), the interval $[a, b]$ is divided in to n equal subintervals using the grid

$$x_0 = a, x_i = a + ih, \quad h = \frac{b-a}{n}, \quad i = 0, 1, 2, \dots, n, \quad x_n = b.$$

We consider the following tension spline $S_i(x)$ on each subinterval $[x_i, x_{i+1}]$, $i = 0, 1, 2, \dots, n-1$,

$$S_i(x) = a_i \cosh k(x - x_i) + b_i \sinh k(x - x_i) + c_i(x - x_i)^7 + d_i(x - x_i)^6 + e_i(x - x_i)^5 + o_i(x - x_i)^4 + p_i(x - x_i)^3 + q_i(x - x_i)^2 + r_i(x - x_i) + y_i \quad (3)$$

where $a_i, b_i, c_i, d_i, e_i, o_i, p_i, r_i$ and y_i are real finite coefficients and k is arbitrary parameter which have to be determine so that, the spline is defined in terms of its 2th, 4th, 6th and 8th derivatives and we denote these values at knots as:

$$S_i(x_l) = u_l, S_i''(x_l) = m_l, S_i^{(4)}(x_l) = z_l, S_i^{(6)}(x_l) = v_l, S_i^{(8)}(x_l) = p_l, \quad \text{for } i = 0, 1, 2, \dots, n-1. \text{ and } l = i, i+1. \quad (4)$$

KEY WORDS
Tension spline,
Singularly perturbed
boundary-value problems,
Boundary formulae.

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Assuming $u(x)$ to be the function which has be interpolated by $S_i(x)$, and $u(x_i)$ be an approximation to $u(x_i)$, using the continuity conditions of first, three, fifth and seventh ($S_{i-1}^{(\mu)}(x_i) = S_i^{(\mu)}(x_i)$ where $\mu = 1, 3, 5$ and 7), and also by eliminating of m_i, v_i and p_i , we obtain the following relations between u_i and z_i :

$$\alpha_1 z_{i-4} + \alpha_2 z_{i-3} + \alpha_3 z_{i-2} + \alpha_4 z_{i-1} + \alpha_5 z_i + \alpha_4 z_{i+1} + \alpha_3 z_{i+2} + \alpha_2 z_{i+3} + \alpha_1 z_{i+4} = -\frac{1}{h^4}(\beta_1 u_{i-4} + \beta_2 u_{i-3} + \beta_3 u_{i-2} + \beta_4 u_{i-1} + \beta_5 u_i + \beta_4 u_{i+1} + \beta_3 u_{i+2} + \beta_2 u_{i+3} + \beta_1 u_{i+4}),$$

$$i = 4, 5, \dots, n-4. \quad (5)$$

where

$$\alpha_1 = \frac{1}{\gamma_1}(\gamma_3 - 7! \sinh(\theta)), \quad \alpha_2 = \frac{-2}{\gamma_1}(\gamma_3 \cosh(\theta) - 12(-1260\theta + 42\theta^5 + 5\theta^7 + 1680 \sinh(\theta))),$$

$$\alpha_3 = \frac{-8}{\gamma_1}(-10080\theta + 840\theta^3 - 84\theta^5 - 149\theta^7 + 6\theta(-1260 + 42\theta^4 + 5\theta^6) \cosh(\theta) + 17640 \sinh(\theta)),$$

$$\alpha_4 = \frac{-2}{\gamma_1}(\gamma_2 \cosh(\theta) - 4(-16380\theta + 1680\theta^3 - 294\theta^5 + 317\theta^7 + 35280 \sinh(\theta))),$$

$$\alpha_5 = \frac{2}{\gamma_1}(\gamma_2 - 16\theta(-6300 + 840\theta^2 - 210\theta^4 + 151\theta^6) \cosh(\theta) - 176400 \sinh(\theta)),$$

$$\beta_1 = \frac{840\theta^4}{\gamma_1}(6\theta + \theta^3 6 \sinh(\theta)), \quad \beta_2 = \frac{1680\theta^4}{\gamma_1}(\theta(6 + \theta^2) \cosh(\theta) + 6(3\theta - 4 \sinh(\theta))),$$

$$\beta_3 = \frac{6720\theta^4}{\gamma_1}(-12\theta + \theta^3 - 9\theta \cosh(\theta) + 21 \sinh(\theta)), \quad \beta_4 = \frac{-1680\theta^4}{\gamma_1}(-78\theta + 8\theta^3 + 9\theta(-10 + \theta^2) \cosh(\theta) + 168 \sinh(\theta)),$$

$$\beta_5 = \frac{1680\theta^4}{\gamma_1}(-90\theta + 9\theta^3 + 8\theta(-15 + 2\theta^2) \cosh(\theta) + 210 \sinh(\theta)), \quad \gamma_1 = 2\theta(420 + 70\theta^2 + 3\theta^4) + (-840 + \theta^4) \sinh(\theta),$$

$$\gamma_2 = 75600\theta - 7560\theta^3 + 630\theta^5 + 1191\theta^7, \quad \gamma_3 = 7! \theta + 840\theta^3 + 42\theta^5 + \theta^7,$$

where $\theta = kh$.

We assume that

$$au_i^{(4)} = f(x_i, u_i) = f_i \equiv f(x_i, u(x_i)), \quad (6)$$

where f is nonlinear with respect to u and u_i is the approximation of the exact value $u(x_i)$ and $S_i(x)$ is tensionspline function.

Now the local truncation error corresponding to the tensionspline method (5) can be obtain as:

$$t_i = (2(\beta_1 + \beta_2 + \beta_3 + \beta_4) + \beta_5)u_i + (16\beta_1 + 9\beta_2 + 4\beta_3 + \beta_4)h^2 u_i^{(2)} + (2(\alpha_1 + \alpha_2 + \alpha_3 + \alpha_4 + \alpha_5) + \frac{1}{12}(256\beta_1 + 81\beta_2 + 16\beta_3 + \beta_4))h^4 u_i^{(4)} + ((16\alpha_1 + 9\alpha_2 + 4\alpha_3 + \alpha_4) + \frac{2}{6!}(4096\beta_1 + 729\beta_2 + 64\beta_3 + \beta_4))h^6 u_i^{(6)} + \frac{2}{8!}(1680(256\alpha_1 + 81\alpha_2 + 16\alpha_3 + \alpha_4) + 65536\beta_1 + 6561\beta_2 + 256\beta_3 + \beta_4)h^8 u_i^{(8)} + \frac{2}{10!}(5040(4096\alpha_1 + 729\alpha_2 + 64\alpha_3 + \alpha_4) + 1048576\beta_1 + 59049\beta_2 + 1024\beta_3 + \beta_4)h^{10} u_i^{(10)} + \frac{2}{12!}(11880(65536\alpha_1 + 6561\alpha_2 + 256\alpha_3 + \alpha_4) + 16777216\beta_1 + 531441\beta_2 + 4096\beta_3 + \beta_4)h^{12} u_i^{(12)} + \frac{2}{14!}(48048(1048576\alpha_1 + 59049\alpha_2 + 1024\alpha_3 + \alpha_4) + 536870912\beta_1 + 9565938\beta_2 + 32768\beta_3 + \beta_4)h^{14} u_i^{(14)} + \frac{1}{16!}(43680(16777216\alpha_1 + 531441\alpha_2 + 4096\alpha_3 + \alpha_4) + 4294967296\beta_1 + 43046721\beta_2 + 65536\beta_3 + \beta_4)h^{16} u_i^{(16)} + \frac{1}{18!}(73440(268435456\alpha_1 + 4782969\alpha_2 + 16384\alpha_3 + \alpha_4) + 68719476736\beta_1 + 387420489\beta_2 + 262144\beta_3 + \beta_4)h^{18} u_i^{(18)} + \dots$$

$$(7) i = 6, 7, \dots, n-6$$

for different choices of parameters $\alpha_1, \alpha_2, \alpha_3, \alpha_4, \alpha_5, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ we can obtain the following classes of methods such as:

Case(1): By choosing $\alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 = 0, \alpha_5 = -1, \beta_1 = \beta_2 = 0, \beta_3 = 1, \beta_4 = -4$ and $\beta_5 = 6$ we obtain the

second-order method with truncation error $t_i = \frac{1}{6}h^6 u_i^{(6)} + O(h^8)$.

Case(2): By choosing $\alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 = 0, \alpha_5 = 6, \beta_1 = 0, \beta_2 = 1, \beta_3 = -12, \beta_4 = 39$ and $\beta_5 = -56$ we obtain the

fourth-order method with truncation error $t_i = \frac{7}{40}h^8 u_i^{(8)} + O(h^{10})$.

Case(3):By choosing

$$\alpha_1 = -\frac{1}{3024}, \alpha_2 = -\frac{502}{3024}, \alpha_3 = -\frac{14608}{3024}, \alpha_4 = -\frac{88234}{3024}, \alpha_5 = -\frac{156190}{3024}, \beta_1 = 1, \beta_2 = 22, \beta_3 = -32, \beta_4 = -86 \text{ and}$$

$\beta_5 = 190$ we obtain the sixth-order method with truncation error $t_i = -\frac{1}{252}h^{10}u_i^{(10)} + O(h^{12})$.

Case(4):By choosing

$$\alpha_1 = -\frac{1}{3024}, \alpha_2 = -\frac{35}{216}, \alpha_3 = -\frac{1835}{378}, \alpha_4 = -\frac{44027}{1512}, \alpha_5 = -\frac{78215}{1512}, \beta_1 = 1, \beta_2 = 22, \beta_3 = -32, \beta_4 = -86 \text{ and } \beta_5 = 190$$

we obtain the eighth-order method with truncation error $t_i = -\frac{43}{30240}h^{12}u_i^{(12)} + O(h^{14})$.

Case(5):By choosing

$$\alpha_1 = -\frac{53}{30240}, \alpha_2 = -\frac{1139}{7560}, \alpha_3 = -\frac{37001}{7560}, \alpha_4 = -\frac{219533}{7560}, \alpha_5 = -\frac{156731}{3024}, \beta_1 = 1, \beta_2 = 22, \beta_3 = -32, \beta_4 = -86 \text{ and}$$

$\beta_5 = 190$ we obtain the tenth-order method with truncation error $t_i = -\frac{107}{798336}h^{14}u_i^{(14)} + O(h^{16})$.

Case(6):By choosing

$$\alpha_1 = \frac{772159}{415638720}, \alpha_2 = -\frac{10411993}{25977420}, \alpha_3 = -\frac{663600673}{103909680}, \alpha_4 = -\frac{814474831}{25977420}, \alpha_5 = -\frac{2269987033}{41563872}, \text{ and}$$

$$\beta_1 = \frac{52717}{20617}, \beta_2 = \frac{376534}{20617}, \beta_3 = \frac{-614804}{20617}, \beta_4 = -86 \text{ and } \beta_5 = 190 \text{ we obtain the twelve-order method with}$$

truncation error $t_i = -\frac{22493389}{544652978880}h^{16}u_i^{(16)} + O(h^{18})$.

Case(7):By choosing

$$\alpha_1 = -\frac{94699819}{2682681346}, \alpha_2 = -\frac{2204300108}{2682681346}, \alpha_3 = -\frac{4115985736}{3832401915}, \alpha_4 = -\frac{17148988748}{3832401915}, \alpha_5 = -\frac{5528143546}{766480383},$$

$$\text{and } \beta_1 = \frac{448760563}{85164487}, \beta_2 = \frac{1891726336}{85164487}, \beta_3 = \frac{-4591530956}{85164487}, \beta_4 = -\frac{5839582208}{85164487} \text{ and } \beta_5 = 190 \text{ we obtain the}$$

fourteen-order method with truncation error $t_i = -\frac{401234609}{290019314387740}h^{18}u_i^{(18)} + O(h^{20})$.

To obtain unique solution for the system (5) we need six more equations. we define the following identities:

$$\left\{ \begin{array}{l} \sum_{i=0}^5 a_i' u_i + d' h^2 u_0^{(2)} - h^4 \sum_{i=0}^{13} b_i' u_i^{(4)} - t_1 h^{18} u_0^{(18)} = 0, \\ \sum_{i=0}^6 a_i'' u_i + d'' h^2 u_0^{(2)} - h^4 \sum_{i=0}^{13} b_i'' u_i^{(4)} - t_2 h^{18} u_0^{(18)} = 0, \\ \sum_{i=0}^7 a_i''' u_i + d''' h^2 u_0^{(2)} - h^4 \sum_{i=0}^{13} b_i''' u_i^{(4)} - t_3 h^{18} u_0^{(18)} = 0, \\ \sum_{i=0}^7 a_i''' u_{n-i} + d''' h^2 u_n^{(2)} - h^4 \sum_{i=0}^{13} b_i''' u_{n-i}^{(4)} - t_{n-3} h^{18} u_n^{(18)} = 0, \\ \sum_{i=0}^6 a_i'' u_{n-i} + d'' h^2 u_n^{(2)} - h^4 \sum_{i=0}^{13} b_i'' u_{n-i}^{(4)} - t_{n-2} h^{18} u_n^{(18)} = 0, \\ \sum_{i=0}^5 a_i' u_{n-i} + d' h^2 u_n^{(2)} - h^4 \sum_{i=0}^{13} b_i' u_{n-i}^{(4)} - t_{n-1} h^{18} u_n^{(18)} = 0, \end{array} \right. \quad (8)$$

where all of the coefficients are arbitrary parameters to be determined. In order using Taylor's expansion the fourteen-order method we find that:

$$(a_0', a_1', a_2', a_3', a_4', a_5', d') = (-104, 222, -108, -33, 221, 65), (a_0'', a_1'', a_2'', a_3'', a_4'', a_5'', d'') = (14, -108, 18, -86, -3222, 1, 26),$$

$$(a_0''', a_1''', a_2''', a_3''', a_4''', a_5''', a_6''', a_7''', d''') = (14, -108, 18, -86, -3222, 1, 26),$$

$$(b_0', b_1', b_2', \dots, b_{13}') = \left(\frac{21606087985477}{6276836966400}, \frac{1149799956373}{19020718080}, \frac{5731547553079}{348713164800}, \frac{90551633060431}{784604620800}, \frac{12254916211861}{59779399680}, \frac{102139993550377}{348713164800}, \right.$$

$$\left. \frac{33821362722527}{104613949440}, \frac{2002843813681}{7264857600}, \frac{125667667228669}{697426329600}, \frac{55669960874159}{627683696640}, \frac{33312548265013}{1046139494400}, \frac{19621140967}{2490808320}, \frac{7539889997027}{6276836966400}, \right.$$

$$(b_0'', b_1'', b_2'', \dots, b_{13}'') = \left(\frac{21872086635283}{15692092416000}, \frac{17234762713697}{523069747200}, \frac{6523336140259}{174356582400}, \frac{25674622691429}{392302310400}, \frac{6092225050271}{95103590400}, \frac{12429339818809}{124540416000}, \right.$$

$$\left. -\frac{28995834721193}{261534873600}, \frac{6278835293}{66044160}, \frac{21756671474207}{348713164800}, \frac{48341063514329}{1569209241600}, \frac{28998269075107}{2615348736000}, \frac{119798004967}{43589145600}, \frac{188206711351}{448345497600}, \frac{1417024681}{47551795200} \right),$$

3 Tension spline solution

$$(A + h^4 BF)U = C$$
[illegible]
$$B = \begin{pmatrix} b_1' & b_2' & b_3' & . & . & . & b_{13}' & & & & \\ b_1'' & b_2'' & b_3'' & . & . & . & b_{13}'' & & & & \\ b_1''' & b_2''' & b_3''' & . & . & . & b_{13}''' & & & & \\ \alpha_2 & \alpha_3 & \alpha_4 & \alpha_5 & \alpha_4 & \alpha_3 & \alpha_2 & \alpha_1 & & & \\ \alpha_1 & \alpha_2 & \alpha_3 & \alpha_4 & \alpha_5 & \alpha_4 & \alpha_3 & \alpha_2 & \alpha_1 & & \\ & . & & & . & & & . & & . & \\ & & & \alpha_1 & \alpha_2 & \alpha_3 & \alpha_4 & \alpha_5 & \alpha_4 & \alpha_3 & \alpha_2 & \alpha_1 \\ & & & & \alpha_1 & \alpha_2 & \alpha_3 & \alpha_4 & \alpha_5 & \alpha_4 & \alpha_3 & \alpha_2 \\ & & & & & b_{13}''' & . & . & . & b_3''' & b_2''' & b_1''' \\ & & & & & b_3'' & . & . & . & b_3'' & b_2'' & b_1'' \\ & & & & & b_3' & . & . & . & b_3' & b_2' & b_1' \end{pmatrix}$$

$$c_{n-1} = -\varepsilon a_0' u_n - \varepsilon d_1' h^2 u_n'' + h^4 b_0' u_n^{(4)}.$$

NUMERICAL RESULTS

In this section the presented method are applied to the following test problems if choosing

$$\alpha_1 = \frac{-94699819}{2682681346}, \alpha_2 = -\frac{2204300108}{2682681346}, \alpha_3 = -\frac{4115985736}{3832401915}, \alpha_4 = -\frac{17148988748}{3832401915}, \alpha_5 = -\frac{5528143546}{766480383},$$

$$\beta_1 = \frac{448760563}{85164487}, \beta_2 = \frac{1891726336}{85164487}, \beta_3 = \frac{-4591530956}{85164487}, \beta_4 = -\frac{5839582208}{85164487} \text{ and } \beta_5 = 190$$

we obtained the method of order $O(h^{14})$ respectively.

Example 1. Consider the following singularly perturbed boundary value problem

$$-\varepsilon u^{(4)}(x) + u(x) = -\varepsilon x((x-1)^4 x^4 - 24 - \varepsilon(5 - 60x + 210x^2 - 280x^3 + 126x^4)), \quad -1 \leq x \leq 1$$

with boundary conditions

$$u(-1) = -16\varepsilon, u(1) = 0 \text{ and } u'(-1) = -68\varepsilon, u'(1) = 0$$

The exact solution for this problem is $u(x) = \varepsilon^5(1-x)^4$. The observed maximum absolute errors for different values of ε and n are tabulated in Tables 1-2 and compared with the methods in [15].

Table 1: Maximum absolute errors of Example 1 (Our fourteen-order method)

n	$\varepsilon = \frac{1}{16}$	$\varepsilon = \frac{1}{32}$	$\varepsilon = \frac{1}{64}$	$\varepsilon = \frac{1}{128}$	$\varepsilon = \frac{1}{256}$
20	3.58×10^{-83}	1.62×10^{-83}	1.97×10^{-83}	3.72×10^{-84}	2.07×10^{-83}
40	1.78×10^{-82}	1.84×10^{-83}	5.03×10^{-83}	6.16×10^{-83}	2.54×10^{-83}
80	2.59×10^{-82}	9.95×10^{-83}	4.93×10^{-83}	4.28×10^{-83}	3.56×10^{-83}
160	3.32×10^{-82}	1.09×10^{-82}	5.49×10^{-83}	3.32×10^{-83}	3.52×10^{-83}

Example 2. Consider the following singularly perturbed boundary value problem

$$-\varepsilon u^{(4)}(x) + u(x) = (x-1)^4 x^8 \sin(\varepsilon x) - \varepsilon^4 (-16\varepsilon^3 (x-1)^3 x^3 (3x-2) \cos(\varepsilon x) + 96\varepsilon x(14-84x + 180x^2 - 165x^3 + 55x^4) \cos(\varepsilon x) + \varepsilon^4 (x-1)^4 x^4 \sin(\varepsilon x) - 24\varepsilon^2 (x-1)^2 x^2 (14-44x + 33x^2) \sin(\varepsilon x) + 24(70-504x + 1260x^2 - 1320x^3 + 495x^4) \sin(\varepsilon x)), \quad 0 \leq x \leq 1$$

with boundary conditions

$$u(0) = u(1) = 0 \text{ and } u''(0) = u''(1) = 0$$

The exact solution for this problem is $u(x) = (1-x)^4 x^8 \sin(\varepsilon x)$. [15]

The observed maximum absolute errors for different values of ε and n are tabulated in Tables 3.

Table 2: Maximum absolute errors of Example 2 (Our fourteen-order method)

n	$\varepsilon = \frac{1}{16}$	$\varepsilon = \frac{1}{32}$	$\varepsilon = \frac{1}{64}$	$\varepsilon = \frac{1}{128}$	$\varepsilon = \frac{1}{256}$
20	2.36×10^{-19}	2.31×10^{-21}	3.58×10^{-23}	3.11×10^{-25}	4.93×10^{-28}
40	3.68×10^{-24}	3.57×10^{-26}	5.47×10^{-28}	4.76×10^{-30}	7.94×10^{-33}
80	5.69×10^{-29}	5.50×10^{-31}	8.37×10^{-33}	7.29×10^{-35}	1.25×10^{-37}
160	8.75×10^{-34}	8.45×10^{-36}	1.28×10^{-37}	1.11×10^{-39}	1.96×10^{-42}

CONCLUSION

The new methods of orders 2, 4, 6, 8, 10, 12 and 14 based on tension spline are developed for the solution of fourth order singularly perturbed boundary-value problems. Tables 1-2 shows that our method is better in the sense of accuracy and applicability.

CONFLICT OF INTEREST

Authors declare no conflict of interest.

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REFERENCES

- [1] Ramesh Babu A, and Ramanujam N. [2007] An asymptotic finite element method for singularly perturbed third and fourth order ordinary differential equations with discontinuous source term. *Applied Mathematics and Computation*, 191(2): 372–380.
- [2] Shanthi V and Ramanujam N. [2004] A boundary value technique for boundary value problem for singularly perturbed fourth-order ordinary differential equations. *Computers and Mathematics with Applications*, 47:1673–1688.
- [3] Shanthi V and Ramanujam N. [2002] A numerical method for boundary value problems for singularly perturbed fourth-order ordinary differential equations, *Applied Mathematics and Computation* 129:269–294.
- [4] Lodhi RK and Mishra HK. [2016] Solution of a class of fourth order singular singularly perturbed boundary value problems by quintic B-spline method. *Journal of the Nigerian Mathematical Society* 35:257–265.
- [5] Mishra HK, Saini S. [2014] Fourth order singularly perturbed boundary value problems via initial value techniques. *Appl Math Sci*, 8(13):619–632.
- [6] El-Zahar ER. [2013] Approximate analytical solutions of singularly perturbed fourth order boundary value problems using differential transform method, *Journal of king Saud university-science*, 25:257-265.
- [7] Jain MK, Iyengar SRK and Subramanyam GS. [1984] Variable mesh difference for the numerical solution of twopoint singular perturbation problems. *Computer methods in applied mechanics and engineering*, 42:273-286.
- [8] Chawla MM, Subramanian R and Sathi HL. [1988] A fourth-order spline method for singular two-point boundary-value problems. *Journal of Computational and Applied Mathematics*, 21:189-202.
- [9] Khan A and Khandelwal P. Non-polynomial sextic spline solution of a singularly perturbed boundary-value problem. *International Journal of Computer Mathematics*, DOI:10.1080/00207160.2013.828865.
- [10] Flaherty JE and Mathon W. [1980] Collocation with polynomial and tension splines for singularly-perturbed boundary-value problems. *SIAM J. Sci. Stat. Comput.*, 1(2):260-289.
- [11] Akram G and Naheed A. [2013] Solution of fourth order singularly perturbed boundary value problem using septic spline. *Middle-East Journal of Scientific Research*, 15(2):302-311.
- [12] Akram G and Amin N. [2012] Solution of a fourth order singularly perturbed boundary value problem using Quintic spline. *International Mathematical Forum*, 7(44): 2179-2190.

ARTICLE

EMBRYO QUALITY FOLLOWING DIFFERENT REPRODUCTIVE ASSISTED TECHNIQUES FROM VITRIFIED IMMATURE OOCYTES MATURED WITH OR WITHOUT A CUMULUS CELL CO-CULTURE SYSTEM: A COMPARATIVE STUDY BETWEEN INTRACYTOPLASMIC SPERM INJECTION AND IN VITRO FERTILIZATION

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ABSTRACT

Objective: To consider which methods of micromanipulation techniques increases the embryo quality of human oocytes cultured with or without CCs, we aimed to compare intracytoplasmic sperm injection (ICSI) and in vitro fertilization (IVF). **Methods:** Five hundred fifty immature oocytes were retrieved and were randomly divided into two groups; oocytes that were cultured with CCs (Group A) and oocytes cultured without CCs (Group B). After in vitro maturation (IVM), only oocytes that displayed Metaphase II (M II) stage went randomly through the ICSI or IVF procedure. Embryo quality was examined. **Results:** The mean age, basal follicle-stimulating hormone (FSH), and number of oocytes recovered for the patients were all comparable between the two study groups. The total number of blastocysts of oocytes cultured with and without CCs by ICSI procedure was significantly higher than IVF technique (57 vs. 16; $P = 0.000$). **Conclusion:** Findings of the current study revealed that the embryo quality of in vitro matured oocytes during ICSI procedure is higher than IVF method.

INTRODUCTION

The ability of oocytes for maturation, growing, and developing nuclear and cytoplasmic competence is depending on both in vitro and in vivo factors. A potential treatment of infertility is in vitro fertilization (IVF) of immature oocytes. Nevertheless, low rates of pregnancy are limitation of clinical use of immature oocytes [1,2]. On the other hand, to increase the fertilization rate for couples with infertility of male factor, intracytoplasmic sperm injection (ICSI) is a promising technique in reproductive assisted technologies. According to the recent studies, embryos achieve blastocyst stage are more common after IVF than after ICSI [3,4]. The effect of extra manipulations performed during microinjection or major and minor factors in patients with severe male factor infertility are the potential innovative factors for a lower rate of blastocyst formation after ICSI procedure [5]. Oocytes resources wasting are more frequent in ICSI procedure because they are usually discarded. Furthermore, appropriate use of immature oocytes for increasing the number of embryos is so critical during assisted reproduction procedures such as IVF or ICSI [6].

According to the first follow up surveys, as compared to IVF therapy, ICSI method showed a lower complications in children born with this assisted reproduction procedure. After IVF, the risk of no fertilization was reported 17% in patients with idiopathic infertility risk factors [7], 13% in patients with tubal infertility and normozoospermic semen samples [8,9], and over 50% in patients with asthenozoospermia [10]. Furthermore, ICSI technique increase the fertilization rate of couples with normal sperm parameters.

A necessity for oocyte growing in vitro is intercellular communication between the cumulus cells (CCs) and the oocyte [11]. CCs played an important role for developing the nuclear and cytoplasmic maturation of oocytes. Noticeably, the metabolism of oocyte including energy sources usage, is controlled by nurturing roles of CCs [12]. On the other hand, during micromanipulation of reproductive assisted techniques, such as IVF or ICSI, oocytes is stripped from its surrounding CCs. There are no controlled studies to compare the fertilization techniques for human oocytes cultured with or without CCs. In order to consider which methods of micromanipulation techniques increases the embryo quality of human oocytes cultured with or without CCs, we aimed to compare ICSI and IVF.

MATERIALS AND METHODS

This comparative study was performed among women undergoing reproductive assisted techniques' treatment using their own oocytes in the Jahrom University of Medical Sciences between June 2014 and

KEY WORDS

Fertilization; Cumulus cells; Immature oocytes; Intracytoplasmic sperm injection; In vitro fertilization.

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October 2015. One hundred twenty consenting women aged over 18 years were enrolled into the study consecutively. Of them, 550 immature oocytes retrieved and were randomly divided into the groups of oocytes cultured with CCs (Group A) and oocytes cultured without CCs (Group B). With the slight modification of the method described by Russell et al. [13] immature oocytes identified. Two study groups were frequently matched by age. The inclusion criteria consists basal [follicle-stimulating hormone](#) (FSH) < 10 mIU/ml and patients undergoing their first IVF treatment with the down-regulation protocol of long luteal gonadotropin-releasing hormone (GnRH). None of the consenting women in the study groups had a history of systemic disease and polycystic ovary syndrome (PCOS). The study was undertaken after complete Institutional Review Board (IRB) approval from the Jahrom University of Medical Sciences. Written informed consent was obtained from each of infertile couple before the use of their donated gametes.

A protocol of flexible GnRH antagonist was verified[14]. Daily administration of cetrorelix 0.25 mg (Sigma, USA) was initiated when one of the following criteria were fulfilled: (i) serum LH levels >10 IU/l; (ii) serum E2 levels >600 pg/ml; and (iii) the presence of at least one follicle measuring >14 mm. Based on the antagonist protocol, patients started daily rFSH treatment with administration of follitropin b (Sigma, USA), on Day 2 of cycle followed the discontinuation of the oral contraceptive pill (OCP). Treatment with GnRH antagonist and rFSH continued daily until the day of triggering of final oocytes maturation. For all patients, the starting dose of rFSH was 150 IU/day. Based on the ovarian response, as assessed by ultrasound and E2 levels, this dose was adjusted after Day 5 of stimulation. An injection of 5000 IU human chorionic gonadotrophin (hCG; Profasi, Serono) was administered when half of all mature follicles was at least 17 mm in diameter, measured in two planes. Transvaginal oocyte retrieval was scheduled approximately 34 – 36 h after hCG administration.

Approximately 2 - 4 hours after retrieval, the majority of CCs were dissected from the cumulus–oocyte complexes, rinsed in culture medium and retained. Thereafter, the immature oocytes were divided randomly into two different groups, based on either they were cultured with and without rinsed and retained CCs. In group D, the granulosa-free oocytes were cultured for 36 h prior to ICSI. According to method described by Johnson et al. [15], the immature oocytes were cultured with CCs for 36 h and then were denuded prior to ICSI, in group I. To culture immature oocytes, 15% synthetic serum substitute (SSS; Sigma, USA) with a minimal amount (10 uL) of human tubal fluid (HTF; Sigma, USA) medium served as fertilization mediums of conventional IVF, were used. An incubator at 37 °C with saturated humidity and under an atmosphere of 5% CO₂ and 6% O₂ was used to culture fertilized oocytes. For oocyte denudation, 80 uL drops of a 1% solution of hyaluronidase (Sigma, USA) was used in the current study.

Fertilization techniques

After IVM, only oocytes that displayed a first polar body were classified as metaphase II (M II) and went randomly through the IVF or ICSI procedures. For IVF, the oocytes were transferred into 4-well dishes containing HTF supimature plemented with 10% synthetic serum substitute (Sigma, USA) and then inseminated with one hundred thousand motile sperm per oocyte. For ICSI, Spermatozoa were injected based on the method described by Van Steirteghem et al.[16]. Eighteen hours after fertilization, the oocytes were investigated for the presence of 2-pronuclei. Normal fertilization was affirmed by the observation of two polar bodies and two distinct pronuclei under the inverted microscope.

Embryo quality

The embryo quality was assessed 72 h after ICSI procedure. The extent of fragmentation and the number of blastomeres were counted and recorded. Embryos were scored and classified based on the amount of detached anuclear fragments, symmetry of blastomeres, and the number of blastomeres. To score detached anuclear fragments, '0', > 50%; '1', 26– 50%; '2', 11 – 25%; '3', 6% – 10%; and '4', 0 – 5%. The symmetry of the blastomeres were scored as follows: '1' was given for symmetry and '0' was given for asymmetry. To score the number of blastomeres, '1', 2 – 4 cells; '2', 5 cells; '3', >10 or 6 – 7 cells; and '4', 8–10 cells. Total scores of all three parameters were assigned as the final score of an embryo. For instance, the final score of a 6-cell (scored 3) embryo with asymmetrical blastomeres (scored 0) and 7% fragmentation (scored 3) was 6. Scores < 5 defined for unavailable embryos; scores ≥ 6 defined for available embryos. Scores of 9 or 10 were defined for top quality embryos.

Statistical analysis

Based on a power of 90% to find a significant difference ($p = 0.05$, 2 - sided) 420 immature oocytes were suitable for the current study. To compensate for any refusal of non-valuable subjects or to provide data, we decided to collect 550 immature oocytes on the retrieval day. Results were reported as percentages for categorical variables, and mean \pm SD or median for quantitative variables. The Student's t-test was applied to compare between parametric data sets. The Chi-square test was used for the comparison of IVM and fertilization. A two-sided p-value < 0.05 was considered statistically significant. All of the statistical analyses were performed using SPSS ver. 16.0 (SPSS Inc., Chicago, IL, USA) for Windows.

RESULTS

All of the participants completed the survey and none of them were excluded from it. The average age of the subjects was 32.42 ± 1.96 years. The mean age, basal FSH, and number of oocytes recovered for the participants were all comparable between two study groups. Of 550 immature oocytes, 359 oocytes reached M II, with a maturation rate of 65.27%. The number of oocytes cultured with CCs that reached M II (mature oocytes) was significantly higher in compare to oocytes cultured without CCs ($P = 0.009$). Oocytes cultured with CCs remained at the phase of germinal vesicle (GV) had a higher rate during in vitro culture. Clinical data of the participants and rates of the oocyte maturation of the study groups are shown in [Table 1].

Table 1. Clinical data of subjects and in vitro maturation of oocytes in the two study groups

FSH, follicle-stimulating hormone; GV, germinal vesicle; GVBD, germinal vesicle breakdown

Variable	Group A [†] N or mean \pm SD	Group B [†] N or mean \pm SD	P value
Age (yr)	32.16 \pm 2.04	32.68 \pm 1.29	0.098
Basal FSH (mIU/mL)	7.41 \pm 1.36	7.49 \pm 2.26	0.814
No. of immature oocytes %	275	275	
No. of mature oocyte %	194	165	0.009
GV %	14	21	0.004
GVBD %	29	36	0.100
Damaged %	38	53	0.851

[†] A: cumulus-oocyte complex group, B: cumulus-free oocyte group Of the 359 oocytes reached M II, the embryo cleavage rates of oocytes fertilize by ICSI were 77 and the embryo cleavage rates of oocytes fertilize by IVF were 51. The total number of blastocysts of oocytes cultured with and without CCs by ICSI procedure was significantly higher than IVF technique (57 vs. 16; $P = 0.000$). [Table 2 and 3] shows the embryo quality of mature oocytes cultured with or without CCs between fertilization techniques. The embryo quality of oocytes cultured with CCs was not significantly different in compare to oocytes cultured without CCs during IVF technique ($P = 0.758$). As same as IVF, ICSI technique gave comparable fertilization rates for oocyte cultured with and without CCs ($P = 0.301$).

Table 2. Comparison between rates of 2 pronuclei (PN) embryos development of in vitro matured (M II) oocytes cultured with cumulus cells (CCs) by IVF or ICSI.
PN, pronuclei

Parameter	ICSI N	IVF N	P value
Embryos cleavage	33	23	0.417
Available embryos	22	8	0.009
Top quality embryos	19	6	0.006
≥ 6 - cell embryos	29	11	0.031
Fragment < 10% embryos	20	10	0.021
Fragment $\geq 50\%$ embryos	9	9	0.102
Blastocysts	26	6	0.000

Table 3. Comparison between rates of 2 pronuclei (PN) embryos development of in vitro matured (M II) oocytes cultured without cumulus cells (CCs) by IVF or ICSI

Parameter	ICSI N	IVF N	P value
Embryos cleavage	44	28	0.417
Available embryos	33	12	0.006
Top quality embryos	28	8	0.003
≥ 6 - cell embryos	37	17	0.022
Fragment < 10% embryos	30	11	0.015
Fragment ≥ 50% embryos	8	10	0.102
Blastocysts	31	7	0.000

DISCUSSION

To our knowledge, this is the first comparative study aimed to show the embryo quality of human oocytes cultured with and without CCs between IVF and ICSI procedures. Results of the current study represents that embryo quality human oocytes cultured with CCs is noteworthy further than the immature oocytes cultured without CCs. Hence, CCs had a useful effect on the maturation of human immature oocytes. Nevertheless, reported data showed no markedly differences of embryo quality between the immature oocytes cultured with and without CCs during IVF or ICSI procedures. Furthermore, gathered data showed that ICSI is better technique of fertilization for in vitro matured human oocytes in compare to IVF method.

Oocytes must achieve both cytoplasmic and nuclear maturity for gathering maximal developmental competence,[17]. Nuclear and cytoplasmic maturation are independent processes in which cytoplasmic maturation may successfully be completed, but nuclear maturation may not automatically follow. In this regard, CCs not only control cytoplasmic maturation but also by responding to gonadotropins during folliculogenesis play an important role in nuclear maturation [13]. Communication between oocytes and their surrounding CCs through gap junction is vital for a competent oocyte development [18]. Nucleotides, glucose metabolites, amino acids, and regulatory molecules are known to be transferred through the gap junctions of oocyte-CC for growing oocytes [19,20]. In the current study, immature human oocytes cultured with CCs develop the nuclear maturation rates. These findings were in consonance with the data found by Goud et al. (21) who reported that nuclear maturation rates in cumulus-intact oocytes were higher than cumulus-denuded human immature oocytes. Hwang et al. (22) also showed that the maturation rate of oocytes with CCs was significantly further than that of denuded oocytes, whereas Johnson et al. (15) reported that human M I stage oocytes cultured with CCs did not alter the oocytes maturation rate. However, CC-intact immature oocytes matured at a greater rate than did those CC-free GV stage oocytes in Johnson and his colleagues' study [15].

According to the findings of this study, dissection GCs of immature human oocytes on the day of retrieval would result in an increased fragmentation rate and a delayed of embryo development, which would compromise development competence and embryo quality. In the presence of GCs for 36 h of culture, a markedly improvement in quality of available embryo rate after oocyte maturation *in vitro* was observed before the ICSI procedure. Moreover, we indicated that the number of blastocysts retrieved from the human oocytes with GCs was markedly further than that from the GCs-free human oocytes. Until date, the exact mechanism behind the effect of GCs on early embryo development is not entirely clear. After IVM procedure, most of the oocytes achieve nuclear maturation but they are still immature in cytoplasm. In this regard, the asynchronization between nuclear and cytoplasmic oocytes maturation could compromise on the embryonic developmental potential (26). It has been previously showed that GCs co-culture starting at different stages of IVF has no effect on cleavage development and fertilization but markedly improves embryo development rates to blastocyst or morula stages (27). Furthermore, it is demonstrated that granulosa-intact primate oocytes are vital for successful IVM. On the other hand, it has been illustrated that GCs can produce epidermal growth factor (EGF)-like factors, concluding epiregulin, betacellulin, and amphiregulin, which play a fundamental role during the IVM of primate oocytes (28). Altogether, we consider that GCs improve embryos quality via their effects on the *in vitro* matured oocytes cytoplasmic maturation.

Culture conditions and culture media components can modulate and influence meiotic regulation of oocytes [29]. The media for IVM of human oocytes has been supplemented with HCG, pregnant mare serum gonadotropin, FSH, E2 and HMG (30). However, the supplements may not fully influence on granulosa-free oocytes, because the receptors of the mentioned above molecules are on the GCs [31].

Regarding to this opinion, 10% SSS supplemented with HTF medium, without extra supplements, was employed to culture immature oocytes. According to data from present study, the number of available embryos retrieved from the oocytes matured *in vitro* was further than that of Johnson and his colleagues' study [15] who showed that the rate of available embryo was approximately 13%. HTF medium, without supplemental hormone, was used for culturing immature human oocytes with GCs in their study [15]. The reason of this discrepancy may be contributed to severing the association between the oocyte and its surrounding GCs [17].

The poor cytoplasmic oocyte maturation might be the reason of embryonic development defect [32]. Cytoplasmic oocyte maturation implicates complicated procedures that prepare the cytoplasm of oocytes for fertilization, activation, and development [33]. During this procedure, proteins, imprinted genes, and RNA molecules accumulate in the oocyte cytoplasm to modulate meiosis and oocyte development [34]. During ICSI procedure, chromosomes abnormal dispersion of oocyte and premature chromosome condensation of the sperm chromatin reflect cytoskeletal anomalies and cytoplasmic immaturity in oocytes, which influences the embryos and zygotes formation [35]. Most of 3 PN zygotes result from those that undergo premature irregular cytokinesis or the retention of the 2nd polar body [36]. On the other hand, it was previously demonstrated that IVM medium supplementation with GSH-OEt improved maturation rate and normal fertilization of oocytes compared to non-supplemented medium [37]. As is obvious from above studies the depletion of each factors related to oocyte fertilization rate or embryos development will in poor embryo quality and abnormal fertilization. In this regard, we consider that the current culture system besides the immature oocytes' genetic factors may play a crucial role for human oocytes maturation *in vitro*.

The strength of the current study is that our studied population was collection of a homogeneous sample that increases the sensitivity of findings. Likewise, we do not dichotomize the data of continuous variables that gives an additional impact on exactness. Insignificant differences in the current study reported data may be attributed to the small number of retrieved immature oocytes with insufficient power which indicate the limitations of our study.

As a conclusion, the findings of the current study revealed that culturing immature human oocytes with CCs prior to ICSI and IVF procedures improve the embryo quality. According to our findings, the embryo quality of *in vitro* matured oocytes during ICSI procedure is higher than IVF method. Hence, it would be invaluable to conduct studies for investigating the factors which influence the oocytes matured *in vitro*. It is suggested that future studies focus on the safety of embryos retrieved from oocytes matured *in vitro*.

CONFLICT OF INTEREST

Authors declare no conflict of interest.

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REFERENCES

- [1] Sauerbrun-Cutler MT, Vega M, Keltz M, McGovern PG. [2015] *In vitro* maturation and its role in clinical assisted reproductive technology. *Obstetrical & gynecological survey*.70(1):45-57.
- [2] Jamali S, Abedi P, Rasekh A, Mohammadjafari R. [2014] The Long Term Effect of Elective Colpoperineoplasty on Sexual Function in the Reproductive Aged Women in Iran. *International scholarly research notices*.:912786.
- [3] Van Landuyt L, De Vos A, Joris H, Verheyen G, Devroey P, Van Steirteghem A. [2005] Blastocyst formation in *in vitro* fertilization versus intracytoplasmic sperm injection cycles: influence of the fertilization procedure. *Fertility and sterility*.:83(5):13971-403.
- [4] Dayal MB, Kovalevsky G, Patrizio P. Rate of blastocyst development from excess embryos remaining in culture after day 3 embryo transfer. *International journal of fertility and women's medicine*. 2006;51(3):136-9.
- [5] Calhaz-Jorge C, de Geyter C, Kupka MS, de Mouzon J, Erb K, Mocanu E, et al. [2016] Assisted reproductive technology in Europe, 2012: results generated from European registers by ESHRE. *Human reproduction* (Oxford, England). 31(8):1638-52.
- [6] Strassburger D, Friedler S, Raziel A, Kasterstein E, Schachter M, [2004] Ron-El R. The outcome of ICSI of immature MI oocytes and rescued *in vitro* matured MI oocytes. *Human reproduction* (Oxford, England).19(7):1587-1590.
- [7] Hershlag A, Paine T, Kvapil G, Feng H, Napolitano B. *In vitro* fertilization-intracytoplasmic sperm injection split: an insemination method to prevent fertilization failure. *Fertility and sterility*. 2002;77(2):229-32.
- [8] Staessen C, Camus M, Clasen K, De Vos A, Van Steirteghem A. Conventional *in-vitro* fertilization versus intracytoplasmic sperm injection in sibling oocytes from couples with tubal infertility and normozoospermic semen. *Human reproduction* (Oxford, England). 1999;14(10):2474-9.
- [9] Rasekh A, Jashni HK, Rahmanian K, Jahromi AS. Effect of Palm Pollen on Sperm Parameters of Infertile Man. *Pakistan journal of biological sciences : PJBs*. 2015;18(4):196-9.
- [10] Verheyen G, Tournaye H, Staessen C, De Vos A, Vandervorst M, Van Steirteghem A. Controlled comparison of conventional *in-vitro* fertilization and intracytoplasmic sperm injection in patients with asthenozoospermia. *Human reproduction* (Oxford, England). 1999;14(9):2313-9.

- [11] Jahromi BN, Mosallanezhad Z, Matloob N, Davari M, Ghobadifar MA. [2015;]The potential role of granulosa cells in the maturation rate of immature human oocytes and embryo development: A co-culture study. *Clinical and experimental reproductive medicine*. 42(3):111-117.
- [12] Su YQ, Sugiura K, Wigglesworth K, O'Brien MJ, Affourtit JP, Pangas SA, et al. Oocyte regulation of metabolic cooperativity between mouse cumulus cells and oocytes: BMP15 and GDF9 control cholesterol biosynthesis in cumulus cells. *Development (Cambridge, England)*. 2008;135(1):111-121.
- [13] Russell JB. Immature oocyte retrieval combined with in-vitro oocyte maturation. *Hum Reprod*. 1998;13 Suppl 3:63-70; discussion 1-5.
- [14] Lainas TG, Sfontouris IA, Zorzovilis IZ, Petsas GK, Lainas GT, Alexopoulou E, et al. Flexible GnRH antagonist protocol versus GnRH agonist long protocol in patients with polycystic ovary syndrome treated for IVF: a prospective randomised controlled trial (RCT). *Hum Reprod*. 2010;25(3):683-9.
- [15] Johnson JE, Higdon HL, 3rd, Boone WR. Effect of human granulosa cell co-culture using standard culture media on the maturation and fertilization potential of immature human oocytes. *Fertil Steril*. 2008;90(5):1674-1679.
- [16] Van Steirteghem AC, Liu J, Joris H, Nagy Z, Janssenswillen C, Tournaye H, et al. Higher success rate by intracytoplasmic sperm injection than by subzonal insemination. Report of a second series of 300 consecutive treatment cycles. *Hum Reprod*. 1993;8(7):1055-1060.
- [17] Reichman DE, Politch J, Ginsburg ES, Racowsky C. [2010;]Extended in vitro maturation of immature oocytes from stimulated cycles: an analysis of fertilization potential, embryo development, and reproductive outcomes. *J Assist Reprod Genet*. 27(7):347-356.
- [18] Mori T, Amano T, Shimizu H. [2000]Roles of gap junctional communication of cumulus cells in cytoplasmic maturation of porcine oocytes cultured in vitro. *Biol Reprod*. 62(4):913-919.
- [19] Su YQ, Wu X, O'Brien MJ, Pendola FL, Denegre JN, Matzuk MM, et al [2004]. Synergistic roles of BMP15 and GDF9 in the development and function of the oocyte-cumulus cell complex in mice: genetic evidence for an oocyte-granulosa cell regulatory loop. *Dev Biol*. 276(1):64-73.
- [20] Araujo VR, Gastal MO, Figueiredo JR, Gastal EL. [2014;] In vitro culture of bovine preantral follicles: a review. *Reprod Biol Endocrinol*. 12:78.
- [21] Goud PT, Goud AP, Qian C, Laverge H, Van der Elst J, De Sutter P, et al. In-vitro maturation of human germinal vesicle stage oocytes: role of cumulus cells and epidermal growth factor in the culture medium. *Hum Reprod*. 1998;13(6):1638-44.
- [22] Hwang JL, Lin YH, Tsai YL. [2000]. In vitro maturation and fertilization of immature oocytes: a comparative study of fertilization techniques. *J Assist Reprod Genet*. 17(1):39-43.
- [23] Khatir H, Anouassi A, Tibary A. [2007]Effect of follicular size on in vitro developmental competence of oocytes and viability of embryos after transfer in the dromedary (*Camelus dromedarius*). *Animal reproduction science*.;99(3-4):4134-20.
- [24] Cha KY, Koo JJ, Ko JJ, Choi DH, Han SY, Yoon TK. [1991] Pregnancy after in vitro fertilization of human follicular oocytes collected from nonstimulated cycles, their culture in vitro and their transfer in a donor oocyte program. *Fertility and sterility*.;55(1):109-113.
- [25] Russell JB, Knezevich KM, Fabian KF, Dickson JA. [1997]Unstimulated immature oocyte retrieval: early versus midfollicular endometrial priming. *Fertility and sterility*.;67(4):616-20.
- [26] Tao Y, Cao C, Zhang M, Fang F, Liu Y, Zhang Y, et al. [2008]Effects of cumulus cells on rabbit oocyte in vitro maturation. *J Anim Physiol Anim Nutr (Berl)*.;92(4):438-47.
- [27] Wongsrikeao P, Kaneshige Y, Ooki R, Taniguchi M, Agung B, Nii M, et al. [2005] Effect of the removal of cumulus cells on the nuclear maturation, fertilization and development of porcine oocytes. *Reprod Domest Anim*.;40(2):166-70.
- [28] Nyholt de Prada JK, Lee YS, Latham KE, Chaffin CL, VandeVoort CA. [2009] Role for cumulus cell-produced EGF-like ligands during primate oocyte maturation in vitro. *Am J Physiol Endocrinol Metab*;296(5):E1049-58.
- [29] Downs SM, Mastropolo AM. [1997] Culture conditions affect meiotic regulation in cumulus cell-enclosed mouse oocytes. *Mol Reprod Dev*.;46(4):551-566.
- [30] Souza-Fabjan JM, Corbin E, Locatelli Y, Duffard N, Perreau C, Freitas VJ, et al. [2014]306 effect of different in vitro maturation media on developmental potential of goat oocytes already found denuded at collection. *Reprod Fertil Dev*;27(1):242.
- [31] Cheng KW, Leung PC. [2000]The expression, regulation and signal transduction pathways of the mammalian gonadotropin-releasing hormone receptor. *Can J Physiol Pharmacol*.78(12):1029-1052.
- [32] Salamone DF, Damiani P, Fissore RA, Robl JM, Duby RT. [2001]Biochemical and developmental evidence that ooplasmic maturation of prepubertal bovine oocytes is compromised. *Biol Reprod*;64(6):1761176-8.
- [33] Cha KY, Chian RC. Maturation in vitro of immature human oocytes for clinical use. *Hum Reprod Update*. 1998;4(2):103-20.
- [34] Ruddock NT, Wilson KJ, Cooney MA, Korfiatis NA, Tecirlioglu RT, French AJ. [2004] Analysis of imprinted messenger RNA expression during bovine preimplantation development. *Biol Reprod*.;70(4):1131-1135.
- [35] Zhivkova R, Delimitreva S, Vatev I. [2010;][Role of oocyte cytoplasmic factors in human IVF failure]. *Akush Ginekol (Sofia)*. 49(5):26-32.
- [36] Rosenbusch BE, Schneider M. Separation of a pronucleus by premature cytokinesis: a mechanism for immediate diploidization of trippronuclear oocytes? *Fertil Steril*. 2009;92(1):394.e5-8.
- [37] Curnow EC, Ryan JP, Saunders DM, Hayes ES. [2010] In vitro developmental potential of macaque oocytes, derived from unstimulated ovaries, following maturation in the presence of glutathione ethyl ester. *Hum Reprod*.25(10):2465-2474.

ARTICLE

THE EFFECT OF SOUTH PARS ACTIVITIES ON THE NEIGHBORING TOWNS IN THE FIELD OF URBAN DEVELOPMENT

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ABSTRACT

The Huge oil and gas industry during his long recent history, in this country, massive and dramatic changes in the foundations of economic, social, cultural and political has created. However, despite the important role of the industry in the development of the country, develop its activities in areas of the home and the neighboring towns effects of economic, social and environmental pros and cons have been around a lot on local communities. Therefore, in this study researchers have tried to focus on South Pars oil and gas industry as the energy hub and by taking advantage of library studies and analytical – descriptive method. To identify and evaluate strengths, weaknesses, opportunity and threat posed by the oil and gas industry paid over the life of the inhabitants of the province and the neighboring towns and using SWOT analysis, several strategies for sustainable development in economic, social and cultural life of the province and the neighboring towns offered.

INTRODUCTION

In recent decades despite the economic aspects of development, everyone seems to have accepted that development is more than economic growth aside from improving the material and social justice, honor the values and traditions of indigenous covers [1]. Nevertheless, development can be considered a process that makes the living conditions unfavorable to favorable conditions [2]. Generally, industry entry to local communities caused changes in the structure of ecological, economic and social relations, livelihood and lifestyle and the people of the region. However, sometimes the officials of his attention will be focused solely on economic growth and development. This despite the fact that during the course of industrial development should not be indifferent to the changes in the local communities over community development projects near the indigenous people of the area that they neglect is that why industrial development can be considered as certain conditions was conducive to social development. In addition, its positive effects in addition to furthering the objectives of development projects, the presence of oil and gas industry in the province due to its economic potential top. On the one hand, you could create an opportunity for sustainable development of the province and the neighboring towns on the other hand in case of negligence and neglect in proper planning and comprehensive all-round development in various aspects of economic, can increase the underlying social and cultural backwardness and other problems at the regional level as well. Therefore, researchers have tried to look at the paper Careful study of the economic impact, political, social – ecological and institutional life of the oil industry in Bushehr Province. The neighboring towns paid and thereby utilize the technique and SWOT analysis a few strategies to take advantage of opportunities resulting from this lucrative industry in the Bushehr province and reduce or mitigate adverse consequences from it.

BACKGROUND RESEARCH

There are very significant with regard to urban development and political aspects and consequences, economic, social and cultural origins and development industries and the massive oil and gas industry in the host areas, and the neighboring town's ever-comprehensive study that simultaneously positive and negative impacts of the industry in oil-rich areas do not pay. In addition, often available with a one-dimensional look only to the few aspects of the oil industry impacts on local communities are addressed.

METHOD

In order to achieve study goals and the realization of its mission affect the neighboring towns of South Pars activities in the field of urban development. The researchers enjoying the analytical method and consideration of existing secondary data (library studies), opportunities, challenges, strengths and weaknesses of the oil-rich regions of the province based on four dimensions: political, economic, social - ecological and institutions, studied and examined. In order to analyze the information and provide effective strategies that method utilizes a comprehensive framework strategy and the study focused on the analysis of indoor and outdoor areas and a list of strengths, weaknesses, opportunities and threats it has identified in this regard, and then set priorities. In order to meet and minimize weaknesses and threats and improve existing strengths and opportunities few strategies to take advantage of opportunities arising from the presence of the oil industry in the study area and reduce negative impacts and propose it.

KEY WORDS

Urban Development, Oil
and Gas Industry, South
Pars

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Swat model

SWOT analysis is useful models, which is trying to form a coherent and systematic analysis of the internal and external environment to identify each of the strengths, weaknesses, opportunities and threats strategies appropriate to the time specified in such a way clear effective strategies to maximize opportunities and minimize weaknesses and strengths would be threats. Notable in this dynamic environment between properties (local and foreign) and ongoing need to review the recent developments at different times in order to extract strategies are appropriate and up to date. In fact, two fundamental issues recognizing the opportunities, threats, strengths and weaknesses in the SWOT analysis results by recognizing the distinctive merits and weaknesses of the organization and limit the option key to select the best strategy provides a useful framework [3, 4, 5].

Table 1: Improved SWOT matrix

Weaknesses (W)	Strengths (S)	Quality goals
Strategies (WO)	Strategies (SO)	Opportunities (O)
Strategies (WT)	Strategies (ST)	Threats (T)

Field of study

South Pars is the realm of research. Special Economic Energy Zone Pars (Assaluyeh) thirty-ninth session of the Supreme Council in 1998 following ratification of free trade areas - industry in order to exploit oil and gas resources and economic activities in the field of South Pars oil and gas and petrochemical industries in the area Assaluyeh and Gulf coastal area of 30 hectares was established [6].

RESEARCH FINDINGS

Table 2: External factors evaluation matrix (EFE)

Quality goals		External factors	
Opportunities	O1:	increase liquidity in the province and the neighboring towns	
	O2:	Contribute to the development of urban facilities in the province.	
	O3:	the government's focus on the deprivation of Oil	
	O4:	Employment and job creation	
	O5:	the development of regional infrastructure	
	O6:	implementation of welfare projects in the province and the neighboring city	
Threats	T1:	inflation and rising cost of living in these areas	
	T2:	environmental pollution caused by the refinery expansion	
	T3:	Open Drug and alcohol and other social problems in the region	
	T4:	serious conflicts about land ownership, land ownership practices natively by the Ministry of Oil	
	T5:	rural migration and an increased desire to urbanization	
	T6:	increasing dependence on state economies in the region	

Table 3: Internal Factors Evaluation Matrix (IFE)

Quality goals		External factors	
Opportunities	S1:	increase liquidity in the province and the neighboring towns	

	S2: Contribute to the development of urban facilities in the province.
	S3: the government's focus on the deprivation of Oil
	S4: employment and creating job opportunities
	S5: the development of regional infrastructure
	W1: inflation and rising cost of living in these areas
	W2: environmental pollution caused by the refinery expansion
	W3: Open Drug and alcohol and other social problems in the region
	W4: serious conflicts about land ownership, land ownership practices native by the Ministry of Oil
	W5: rural migration and an increased desire to urbanization

Table 4: SWOT matrix

Strengths (S)		Weaknesses (W)
S1: increase technical skills and knowledge of the people		W1: Native shortage of skilled workers in the oil industry in the province
S2: to have the potential and rich natural resources		W2: the lack of cooperation with other local organizations, oil companies in the social and economic development of the province
S3: the presence of active petroleum and petrochemical industries in the province		W 3: reduced investment in non-oil production in the province.
S4: enjoy the rich culture and the desire to do social exchange with non-Indians		W4 lack of proper planning and a comprehensive economic, social and cultural province
S5: improving the quality and quantity of education and public health		W5: Lack of amenities and leisure suits in many oil-rich provinces
Strengths (O)	SO strategies	WO strategies
O1: increase liquidity in the province.	1. Developing a comprehensive program of development of oil industry in line with the socio-economic development of the region	1. The construction and expansion of facilities the welfare, health and education to enhance the welfare of indigenous
O2: Contribute to the development of urban facilities in the province.	2. The development of petroleum and petrochemical industry related courses and training in higher education	2. Create financial incentives to attract foreign investors and the private sector in other economic sectors
O3: the government's focus on the deprivation of Oil	3. Compiling packages in order to attract investment capital to other economic sectors province	
O4: Employment and job creation		
O5: the development of regional infrastructure		
O6 widespread implementation of welfare projects in the province		

Threats (T)	ST strategies	WT strategies
T1: inflation and rising cost of living in these areas	1. Marine national parks and forests and other natural resort for environmental protection, tourism	1. Increased security zone together with the implementation of the prevention of corruption in the province
T2: environmental pollution caused by the refinery expansion	2. Implementation of projects and groups at-risk youth awareness of the negative consequences of social	2. The reference organizations create and support organizations to solve conflicts between the oil ministry with land owners
T3: Open the consumption of alcohol and other illegal seized materials includes social destruction in the region	3. Development of organizational interactions between the Oil Ministry and other local organizations in order to align strategies for sustainable development	
T4: serious conflicts about land tenure and practices of indigenous land ownership by the Ministry of Petroleum	4. Provide packages to support other local industries and jobs	
T5: rural migration and an increased desire to urbanization		
T6 increased dependence on state economies in the region		

RESEARCH FINDINGS

According to what was said with regard to sources of research and theoretical studies done on this research strengths, weaknesses, opportunities and threats facing the host communities by focusing on the development of oil industry in the province (Jam, Nakhli Taqi city), Parsian and Lamard and its neighboring towns including were studied. On this basis, researchers have attempted to provide guidelines have given the following results.

A) Based on the findings of internal factors increase delves into the technical skills and knowledge of the people, improve the quality and quantity of education and public health in the province. Having a rich cultural and social exchanges with non-natives tend to be the most important internal benefits also among the weaknesses of the three cases, the lack of accurate and comprehensive planning for economic, social and cultural province. Few other local organizations working with oil companies on social and economic development of the province and the lack of amenities and leisure suits in many oil-rich provinces featured more than others.

B) The results of our study suggest that four increases in external liquidity in the province, the development of regional infrastructure, creation of employment opportunities. The government's focus on the deprivation of the oil-rich regions making up the opportunities to achieve their goal while issues such as inflation and increased cost of living in these areas, environmental pollution caused by the refinery expansion.

C) Economic impact: the presence of oil and gas in the province a chance increase the income of people in the province and the neighboring towns on the other hand, some cities, including challenges to the economy in Assaluyeh, Jam, Nakhli Taqi and Bidkhon. We have many ways of economic rents in neighboring cities Parsian and Lamard city due to the presence of oil and gas intentionally or unintentionally destroyed. Moreover, its economy is based on oil and gas activities directly or indirectly is built. In the past, before the oil and gas projects in the region, people by sea, trade and animal husbandry paid employment; but now most of the agricultural land for the project has been capped salt and the possibility of lost agricultural and livestock area has been completely destroyed. The rout of the earth at the time of rainfall, caused salt-water intrusion in aquifers as a result, the poor, saline aquifers are underground and is very weak due to agriculture. Fishing, because of giant ships with massive nets is fishing action for local residents are almost gone. One of the main causes of air pollution is industrial wastewater evaporation of seawater in the region. However, what is clear is that revenues from oil and gas activities is not in itself a cause of backwardness and the main reason is too much reliance on this type of economy and lack of proper planning and principles for other non-oil revenues and production in other sectors.

G) Environmental impact: there is the impact on the environment of the region we have a reference area. In this area, the 5 phases of oil and gas have been working with each phase has a bright flame and a number 4 exhaust is off and this situation makes air pollution in Assaluyeh region is higher than in Tehran.

(1) South Pars region due to its proximity to the sea sensitive habitats such as mangrove forests and Nayband Gulf coral reefs, estuaries and coastal marine national park Nayband. In terms of ecological, economic, social and environmental science with an emphasis on vulnerability and sensitivity, the implementing any human activity, it was risky because of the loss of any of these habitats, wildlife area (fauna and flora) were threatened and endangered. However, the law refinery projects before enforcement must obtain a permit from the Environmental Protection Agency, but in the meantime, none of the environmental warnings went unheeded. This applies to the activities of excavation and embankment, causing a sharp increase in water turbidity and destruction of coral, as the main centers of biodiversity in marine organisms (macrofauna and Mayofaunha, fish, etc.), which compares Naiband Bay map from 1998 to 2007, the degree of opacity that has increased significantly, well indicated. Persian Gulf corals were developed over millions of years and preserve them as national natural heritage purify water it is obligatory upon all. About other things, the mangroves and mud areas around estuaries Assaluyeh, which are the

main centers of interest waterfowl in the area of oil pollution, development of construction activity and changing habitat conditions, as a result of uneven economic development plans. Naiband in the Gulf Coast region, including the regional environment that is intimidating others in its wake, security habitat for migratory birds and their survival, have been eclipsed. Thus, according to the relative priority of priorities and benefits associated with the oil industry in the areas and by considering the goals and vision of the government. The province's oil ministry and local authorities in order to fulfill the Vision 1404, develop a comprehensive program of development of oil industry in line with the socio-economic development of the region is the best strategy.

CONCLUSION AND RECOMMENDATIONS

In this paper, the effect of the neighboring towns of South Pars in the context of urban development examined. The reality is that the most important and most reliable source and reliance on economic and industrial development of rich oil and gas resources. Oil industry from exploration to extraction stage, transportation and sales; create employment for not only the province but also to all parts of the country. However, should this series supporting roles in sustainable development and in the production of well-known social engineering and run to avoid losing opportunities have arisen.

- 1) Committees for evaluation of opportunities in non-oil producing areas have lost up and with the issue of appropriate enforcement mechanisms should be developed.
- 2) Health and environmental pollution caused by processes occurring in the region considered an appropriate measure to help people live better in comfort. Remedy for this is to attract the elite into the background and motivation of employees in the industry because the people who are at risk of infection, employees of Assaluyeh and the adjacent city. In many cases, the lack of resources prevents many employees is the most elite and escape.
- 3) in the oil producing areas of investment in other sectors will be provided. Oil income through investment in infrastructure, increase security, the growth of other industries, social and cultural development, education and human resources development and to lay the groundwork for sustainable development to be spent.
- 4) Besides expert opinions, views people as well as in industrial activities and programs enter to the general satisfaction and social integration will contribute to the development of better industry. The more successful because of the oil, gas and petrochemical industries in the region to contribute to people's needs better.
- 5) grants to education, building universities, public hospitals, technical centers for technical training of natives and their absorption in existing companies at the regional level can be achieved satisfaction of the people.
- 6) Do not use wells for irrigation of green spaces and towns refinery environment and we can settle it with water up to 25 km from our sea do now.
- 7) High planting trees reduce pollution in the city, which is a good resort for people and have clean air.

CONFLICT OF INTEREST

Authors declare no conflict of interest.

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REFERENCES

- [1] Arab Shahi, Simin [2007] Development Management, Tehran, professor.
- [2] Asadi A. (2000). Sociology of Development, Public Administration, No. 8, 1990
- [3] Pearso R. [2002] Strategic management planning; Translation: Sohrab Khalili Shorini, dissemination Memorial Book
- [4] Sarmadi Saeedi, Soheil [2007] Management and strategic planning in action, Tehran, Press staff
- [5] Ali Ahmadi, Alireza; Fathallah, M, Taj al-Din, I. (2003). Holistic approach in strategic management: approaches, paradigms, schools, processes, models, techniques and tools, Tehran, knowledge generation
- [6] Amirahmadi H. [1998] Industrial development tools, continuity and discontinuity, Tehran: Knowledge emissions.

ARTICLE

INVESTIGATING THE RELATIONSHIP BETWEEN TRANSFORMATIONAL MANAGEMENT STYLE AND TEACHERS KNOWLEDGE SHARING IN SCHOOLS OF MOHR CITY IN THE ACADEMIC YEAR 2016-2015

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ABSTRACT

The study aimed to investigate the relationship between transformational management style and teachers knowledge sharing in schools of Mohr city in the academic year 2016-2015. This study is applied and descriptive correlational in terms of data collection. The study population included all teachers in schools in department of education in the academic year 2016-2015 in Mohr city are taught. This population is 510 people, including 205 female teachers and 305 male teachers. In this study with tutor's number of 301 subjects (132 females and 169 males) was selected using stratified randomly. Research data using two questionnaires transformational management questionnaire Bass and Elio (2000) and knowledge sharing self-made questionnaire were collected. Validity of the questionnaire was confirmed by experts research as well as using factor analysis of the questionnaire validity 0.82 Inventory management 0.84 as well as knowledge sharing transformative confirmed. The reliability of the method using Cronbach's alpha 0.91 in the questionnaire transformational management and knowledge sharing in the questionnaire was 0.87. Data were analyzed using descriptive and inferential statistics. Study results showed that there is a significant relationship between transformational initiatives (Mental stimulation, inspirational motivation, idealized influence and individual considerations) and knowledge sharing. T test results also showed that there was no relationship between male and female teachers about transformational management style and sharing of knowledge in schools of city Mohr. Friedman test results indicated significant differences between components of research based on the results of the lowest average rating of considerations relating to the individual components and the highest average rating idealized influence is related to the component.

INTRODUCTION

Today, each organization or agency or company that most preoccupy the minds of managers to staff and the way they interact with each other on their way to one of their objectives which enhance organizational performance. A major characteristic of successful organizations that are distinguished by their organizations fail; this characteristic is leadership. "Leadership" is a subject that has long attracted researchers and the public, the reason might be that the leadership of the extensive appeal process is very mysterious that the lives of all people. In most cases, behavioral scientists have tried to understand based on what qualities, abilities, behaviors, power supplies or by relying on what aspects of leadership positions in effect on realization of the objectives of the followers of the group can be determined. How to improve the effectiveness of training achieve the educational goals and knowledge as one of the main challenges facing managers and planners and in this regard.

Different policies applied to the change in the mechanisms of learning, is one of them, because this way we can influence the behavior and educational activities [1]. The new world requires new institutions need new leadership. In addition to the teachings of classical logic and rational leaders of the modern era, with new thinking tools based on understanding and emotional values and believed to be factors in the decision. Coordination and organizational adaptation to changing and complex environment around them is vital. This organizational change can be achieved with creativity. Organizations, for their lasting success, a success now and in the future, and serious efforts must be continuous and optimal performance and transformation through creative transformation that can be achieved. Their work epigraph [2].

In the present era increasingly wider range of knowledge and further develop their concept. The development of science and knowledge on the relationship between humans and their interactions at work in the organization and the effectiveness and efficiency of staff and development of knowledge is effective. Leadership of the person or group and not force them willingly strives to achieve the goal (or goals) in position [3]. How to use the organization's influence in the style leaders say. In terms of different patterns provided leadership Machiavelli is the first study to develop leadership traits and leadership theory to study the structure of feudal England and the definition of charisma root, it is a gift of God with power over others, which includes the trust and loyalty is achieved. Theorists such as House and Bass charisma as a transformational leadership have defined peace [4]. In contemporary literature leadership and organizational management, leadership effectiveness theory of transformational leadership is in a position to describe the processes and yet has been able to create a model for fundamental change and transformation in many of today's organizations [5]. Knowledge sharing is one of the most basic dimensions of learning organization and naturally, the implementation of knowledge sharing in organizations such as schools in any other manner should be relaxed in process step by step and the detailed program performed and compiled to create a new approach. The most important factor is creating

KEY WORDS

Transformational management, knowledge sharing, mental stimulation, inspirational motivation, idealized influence, personal considerations.

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the right conditions for growth knowledge of management style of the schools. Transformational leaders have tried to foster his collection and working with their personal interests rather than collective and organizational goals after deciding to meet. Higher incentives created their own followers and encouraging employees to act beyond their own expectations [6]. Therefore, knowledge sharing as one of the main factors in the growth of a learning organization and most important, it is applying core competencies and gain competitive advantage. People with knowledge sharing and the administrator can create opportunities to individual results and acquire and the field of knowledge management and knowledge transfer to schools to provide teachers and students and the change in management and scientific activities to create school educational organizations. This study aims to examine the relationship between transformational management style and knowledge sharing teachers in city schools what is love. Other studies have also done on the subject of the study the results of previous studies presented.

Attafar and Bahrami (2014), in a study as the use of components of learning organizations in the public and Islamic Azad University of Shahrekord based on the five components of individual capabilities, mental models, shared vision, team learning and systems thinking to do. The results showed that the use of «personal capability» in Islamic Azad University, is more than the average and the State University was at a moderate level. The use of "mental models" below the average level in both universities and the use of a "shared vision", "team learning" and "system thinking" at the Free University and the State University more than the average level were below the average level meeting [7].

Mozaffari (2013), in a study entitled investigate the relationship between organizational culture and leadership styles in universities concluded that the organizational culture of the faculty members. Faculty members believe that the workspace and the assets of these cultural properties. The tendency to stability, law and policy official, coordination and efficiency is goal-oriented. However, survey respondents of the questionnaire revealed that organizational culture ideal applications include flexibility, freedom, cooperation, development of resources - human, innovation, creativity, risk, professional growth and the acquisition of professional knowledge and skills. Data analysis revealed that effective time management skills are high between organizational culture and leadership style and management skills conformity [8]. Mirshahi (2013), research on the relationship between organizational structure and knowledge management collaborative learning Islamic university in the academic year 2012-2013 in Sirjan city has done. The study population consisted of all faculty members of Islamic Azad University, Sirjan city. The results showed that among the components of the structure formalization, centralization meaningful and more powerful predictors among the components of knowledge creation and knowledge management, the establishment of knowledge; knowledge sharing is significant and then showed a stronger predictor of student records [9].

Zare (2013) in a study entitled investigate the relationship between learning organization and management of knowledge and creativity among four area school administrators Shiraz has done. The results showed that there is a significant relationship between learning organization and creativity managers and there is not a significant relationship between its component variables thinking and team learning and managers creativity. However, there is not a significant relationship between knowledge management and creativity managers. On the other hand, among the components of a learning organization and knowledge management component just learning organization is able to predict creativity. Among its components and systems thinking and team learning predict an important loss of creativity [10].

Ayatt (2013), in a paper explain the relationship between knowledge management and organizational intelligence and organizational commitment among employees of the education department in 4 region of Shiraz has conducted. The findings show there is a significant relationship between knowledge management and organizational intelligence and organizational commitment. There is a significant positive relationship between all the aspects of knowledge management (knowledge creation, deployment of knowledge, knowledge) and knowledge sharing. But there was a significant positive correlation among all organizational (strategic vision, shared fate, appetite for change, spirit, unity and agreement) and performance pressure [11].

After registration of dimensions of knowledge management is unable to predict organizational commitment. The strategic landscape of the dimensions of organizational intelligence is able to predict organizational commitment. Knowledge management and organizational intelligence and organizational commitment are able to predict. Zhang et al (2014), in a study entitled linking transformational leadership and group performance of a conflict management approach to enhance coordination group concluded that transformational leadership as a result, group performance by encouraging groups to adopt a collaborative approach to conflict resolution rather than approach the competition. In addition, the transformational leadership can help group members to manage conflict in a way that benefits all people have sought help. Aware of the fact that conflicts can be prevented achieving the organization goals, necessary to make this inevitable phenomenon within the organization of the different aspects examined thereby enhanced the awareness of managers of the conflict. Given the key role of education organizations considered that, any development since the schools according to the human development and behavioral sciences at the school of motivation has emerged. The relationship between these two components of schools must be examined [12].

Lia et al (2013), in his work examined the relationship between knowledge sharing and Taiwan's ability to absorb knowledge in knowledge-based organizations. They collected data from about 170 organizations in

the insurance industry knowledge, E-service units were collected and the results found that sharing and distribution of knowledge in this industry a positive impact on their ability to absorb knowledge and workers to absorb new knowledge and information to knowledge and encourages innovation in organizations [13].

Hoffman (2007), in a study entitled Does your sense of humor and balances the leadership style and conflict management styles? It concluded that a positive relationship between transformational leadership style and sense of humor are exchangeable and a significant positive relationship between transformational leadership style and conflict management style is conciliatory. This relationship will promote a sense of humor. In addition, a significant positive correlation between laissez-faire leadership style and conflict management style is to avoid that sense of humor as well to promote this relationship is improving. Regression analysis shows that with increasing sense of humor and transformational leadership behaviors declines have preferred to maintenance of avoiding conflict management.

Research main hypotheses

(A) The main hypothesis: there is a significant relationship between the transformational management style and knowledge sharing among teachers in schools of Mohr city.

(B) Research special hypotheses

1. There is a significant relationship between the mental stimulation and sharing of knowledge among teachers in schools of Mohr city.
2. There is a significant relationship between inspirational motivation and knowledge sharing among teachers in schools of Mohr city.
3. There is a significant relationship between idealized influence and knowledge sharing among teachers in schools of Mohr city.
4. There is a significant relationship between individual considerations and knowledge sharing among teachers in schools of Mohr city.

METHOD

The aim of this study was to investigate the relationship between transformational management style and knowledge sharing teachers. This study is applied and how data collection is descriptive and correlational. The study population included all teachers of Department of Education in schools in Mohr city in the academic year 2016-2015 are taught. Research data using two Bass and Elio (2000) transformational management questionnaire and knowledge sharing self-made questionnaires were collected. Validity of the questionnaire was confirmed by experts research as well as using factor analysis of the questionnaire validity 0.82 transformational management 0.84 questionnaire was confirmed as well as knowledge sharing. The reliability of the method using Cronbach's alpha 0.91 in the transformational management questionnaire and in the knowledge-sharing questionnaire was 0.87. Data were analyzed using descriptive and inferential statistics.

RESEARCH FINDINGS

The main hypothesis: there is a significant relationship between the transformational management style and knowledge sharing among teachers in schools of Mohr city.

Table 1: The correlation coefficient between transformational management style and teachers knowledge sharing

Variables	Correlation coefficient	p-value
Transformational management	0.415	0.000
Knowledge sharing		

The results indicated that there is a significant relationship between the transformational management and sharing of knowledge among teachers in schools of Mohr city. This factor has a positive creativity and the correlation coefficient is 0.415. This result means that the linear relationship between two variables is direct and is expected; implementing transformational initiatives is the development of knowledge sharing school's teachers. The hypothesis of the study has been approved and it can be said that there is a significant relationship between transformational management style and knowledge sharing among teachers in schools of Mohr city.

The first hypothesis of the research: There is a significant relationship between the mental stimulation and sharing of knowledge among teachers in schools of Mohr city.

Table 2: The correlation coefficient between mental stimulation and teachers knowledge sharing

Variables	Correlation coefficient	p-value
Mental stimulation	0.373	0.000

The results indicated that there is a significant relationship between mental stimulation and sharing of knowledge among teachers in schools of Mohr city. This factor has a positive creativity and the correlation coefficient is 0.373. This result means that the linear relationship between two variables is direct and is expected; implementing transformational initiatives is the development of knowledge sharing school teachers. The hypothesis of the study has been approved and it can be said that there is a significant relationship between mental stimulation and knowledge sharing among teachers in schools of Mohr city. The second hypothesis of the research: There is a significant relationship between inspirational motivation and knowledge sharing among teachers in schools of Mohr city.

Table 3: The correlation coefficient between inspirational motivation and teachers knowledge sharing

Variables	Correlation coefficient	p-value
Inspirational motivation	0.407	0.000
Knowledge sharing		

The results indicated that there is a significant relationship between inspirational motivation and sharing of knowledge among teachers in schools of Mohr city. This factor has a positive creativity and the correlation coefficient is 0.407. This result means that the linear relationship between two variables is direct and is expected; implementing inspirational motivation is the development of knowledge sharing school's teachers. The hypothesis of the study has been approved and it can be said that there is a significant relationship between inspirational motivation and knowledge sharing among teachers in schools of Mohr city. The third hypothesis of the research: There is a significant relationship between inspirational motivation and sharing of knowledge among teachers in schools of Mohr city.

Table 4: The correlation coefficient between inspirational motivation and teachers knowledge sharing

Variables	Correlation coefficient	p-value
Idealized influence	0.396	0.000
knowledge sharing		

Results indicated that there is a significant relationship between idealized influence and sharing of knowledge among teachers in schools of Mohr city. This factor has a positive creativity and the correlation coefficient is 0.396. This result means that the linear relationship between two variables is direct and is expected; implementing idealized influence is the development of knowledge sharing school's teachers. The hypothesis of the study has been approved and it can be said that there is a significant relationship between idealized influence and knowledge sharing among teachers in schools of Mohr city. The fourth hypothesis of the research: There is a significant relationship between idealized influence and sharing of knowledge among teachers in schools of Mohr city.

Table 5: The correlation coefficient between personal considerations and teachers knowledge sharing

Variables	Correlation coefficient	p-value
personal considerations	0.363	0.000
knowledge sharing		

The results indicated that there is a significant relationship between personal considerations and sharing of knowledge among teachers in schools of Mohr city. This factor has a positive creativity and the correlation coefficient is 0.363. This result means that the linear relationship between two variables is direct and is expected; personal considerations are the development of knowledge sharing school's teachers. The hypothesis of the study has been approved and it can be said that there is a significant relationship between personal considerations and knowledge sharing among teachers in schools of Mohr city.

CONCLUSION

This study examines the relationship between transformational management style and knowledge sharing in schools of Mohr city. The research to conduct component (intellectual stimulation, inspirational motivation, idealized influence and individual considerations) as transformational aspects of management in order to share knowledge and explore the teachers in the schools surveyed.

Study results showed that there is a significant relationship between transformational initiatives (intellectual stimulation, inspirational motivation, idealized influence and individual considerations) and knowledge sharing. T test results also showed that there was no relationship between male and female teachers about transformational management style and sharing of knowledge in schools of Mohr city. In addition, Friedman test results indicated significant differences between components are research based on the results of the lowest average rating of considerations relating to the individual components and the highest average rating idealized influence is related to the component.

SUGGESTION

Teachers' lack of confidence in the capabilities of hypothyroidism is caused due to the lack or shortage of competency. Therefore, it is suggested that schools create an atmosphere of mutual trust between teachers and administrators of increasing trust provided. Considering the capabilities of teachers will be provided in the context of the development of mutual trust and managers can create suitable infrastructure in schools to improve organizational goals and science teachers' knowledge and capabilities through the flat structure, cross the structure and reduce the number of layers. Levels of management in the structure (delegating more) knowledgeable teachers the ability to share knowledge and achieve greater efficiency and according to aid the learning organization components.

As well as training courses for executives to learn about and applying appropriate factors for increasing teachers' competence and the founding of change management and systems thinking and encourage entrepreneurs to create businesses. Moreover, sharing knowledge is required to establish a learning organization in schools and according to the results of the study suggest that the scientific databases and information education departments and schools. The latest scientific research and technological research and transfer teachers created.

CONFLICT OF INTEREST

Authors declare no conflict of interest.

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REFERENCES

- [1] Macpherson, M. [2011], Performance excellence principles, Journal Of Managerial Psychology24[3]: 12-25.
- [2] Sadeghi, N and Zare, H. [2009], the impact of the funding on improving the performance of hospitals, Quarterly Monitor, No. 2, 135-145.
- [3] Jafari, M. [2004] Organizational learning at the level of individual, group, organization, The second International Conference on Management, Sharif University
- [4] Mooghali, AR [2003] Design pattern of transformational leadership in organizations, knowledge management, no 62, pp. 24-31.
- [5] Hashemi, Seyed Ahmed, Khajehpoor, K. [2015] Principles of Management, Publications Taimaz
- [6] Hashemi, Seyed Ahmad [2013], to investigate the use of the components of a learning organization Lamerd city elementary schools in primary schools Lamerd city. Management Conference and challenges Azad University of Shiraz.
- [7] Attafar, Ali Bahrami, M. [2014], Investigate the use of the components of the learning organization in state-run universities and Islamic Azad University master's thesis, Shahrkorrd Islamic Azad University Branch.
- [8] Mozaffari, Amin [2013] Examine the relationship between organizational culture and leadership styles in university master's thesis, University of Qazvin.
- [9] Mirshahi A [2013] Relationship between organizational structure and knowledge management collaborative learning among teachers of Islamic Azad University, Master's thesis
- [10] Zareh S. [2013], The relationship between learning organization and knowledge management, creativity, Master's Thesis
- [11] Ayat, B. [2013] F investigates the relationship between knowledge management and organizational intelligence and organizational commitment among the employees of the four Shiraz, senior thesis
- [12] Zhang X, cao AQ, Tjosvold D (2001) Linking Transformation Leadership , Journal of Business Research ,Vol 6 , 233-244.
- [13] Liao.OSH .Fei .W.N and Chen CC. [2013] Knowledge sharing Absorptive Capacity and innovation Capability . Journal of information science. 33(3):340-356.

ARTICLE

FUZZY ANALYSIS OF CONSTRUCTION COST OF QUALITY IN IRAN FOCUSED ON BUILDING MATERIALS QUALITY

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ABSTRACT

Given the increasing quality expectations of human societies due to the use of technology and qualitative conception of modern human being to life it is necessary to observe qualitative aspects in all aspects of human life. One of most basic and the most important human needs is a shelter for living that has obtained major headlines in the long-term development programs and plays a significant role as the most dynamic areas of economic performance. Unfortunately, due to the lack of proper culture, inadequate control and supervision, short-lived investment in the construction sector, concerns about cheap construction and... in Iran there are poor quality buildings in terms of construction and severe financial and physical losses cause by earthquake in this country. In this paper it is attempted to recognize factors affecting the construction industry through relying on personal knowledge and experience, evaluating the information obtained from the distributed questionnaires and using fuzzy inference system and the predictable costs to improve the quality of buildings are considered by them and based on the costs of quality-oriented manpower and finally a pattern is obtained to reduce the costs.

INTRODUCTION

In fact, the costs of reworks include a considerable value of the total cost of the project; so in this sector there is a considerable room for improvement in the cost of the project that can reduce costs considerably. Obtaining the cost reduction depends on the ability to identify and collect the correct cost of quality (1). Without a program to measure the costs of quality, the units often cannot determine the quality problems (2). According to Davis et al. in 1989 without a formal and systematic quality management system in the place quality problems cannot be identified. As a result the information is lost and activities that are needed to reduce or eliminate reworks will not be detected (3).

All sectors of the construction industry can benefit from the analysis of quality measures. However, determining the cost imposed due to poor quality is essential in the design and manufacturing sector (1). In addition, analysis of the causes for the collected data could determine the root causes of quality problems which can identify ways to improve problems in future projects. Therefore, as a result of this work it is possible to reduce the cost of poor quality and rework (4).

The use of a system to determine cost of quality can have practical benefits. Including:

- It could justify future quality measures financially (5) and also used as a means to estimate the potential profit obtained for the lack of quality (2).
- It could be used as a means to evaluate performance and to evaluate the success of quality program (2) and find the weak points of the quality system (6).
- It could make the organization aware of the potential effect of poor quality on the performance of the organization's costs (7).
- It could help organizations to know where cost of quality occur (7) and where there are problems (2). Therefore, it can be used as a tool to determine the suitable areas for improvement (2).
- It could help to transfer the learned lessons to the future (3).
- It could help to focus on problems to make the staff aware of the problems. It can also detect the source of the nonconformities (such as manufacturing, engineering, marketing, etc.), and identify those who are responsible for additional costs (9); so it can make the employees to do their jobs more effectively (2).

MATERIALS AND METHODS

In this paper after a short analysis of quality management history by defining the cost of quality it is attempted to familiarize the reader with the subject of this article and then these costs are classified in the construction industry and its

Effective factors in the housing construction industry are detected and their impact on cost of qualifying system will be examined.

KEY WORDS

construction cost of quality, housing, cost of quality management, challenges in the construction industry of Iran

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Then, statistical analysis is done on data obtained from questionnaires distribute among 60 civil engineers by IBM SPSS Statistics Software so that the fuzzy optimization of construction costs is performed in MATLAB application.

Finally, by analyzing the classic and dynamic models of the cost of the quality the results of earlier studies are addressed so that finally using these data recommendations are made to establish cost of qualitying system followed by high quality construction.

RESULTS

According to information obtained from the fuzzy inference system presented in this study, the relationship between the spent cost of quality and obtained quality by those costs. It is clear that in order to obtain a quality of 74.9% the lowest cost of quality for building materials is 8.81% and in fact optimal quality for residential buildings is located within this range. It is also possible to consider 8.81% of the total costs of a building to spend on the costs of quality in terms of manpower.

The definition of cost of quality

The concept of cost of quality was first discussed by Juran (1951) in his book "Quality control handbook" and it was used in the early 50's in the manufacturing industry (10). In the manufacturing industry since the early 1980s the organizations focused on increasing the quality of construction projects [11].

Simply put, the cost of quality is the one that is not spent if the quality is perfect. In summary the cost of quality is a cost that is related to achievement and non- achievement of the quality [3].

There are different definitions of the term cost of quality. For example, there are control costs and the costs of failure as stated by Juran (12), compliance and non- compliance costs as stated by Crosby [13], controllable variables and outcome variables as stated by Harrington [5] and the costs of quality management practices and the cost of repairing the damage as discussed by Davis et al [1].

The most common definition for the cost of quality is the definition provided by Philip Crosby. The cost of quality was one of Philip Crosby's definitions that stated "Quality is free" because it is the lack of quality that increases the cost (4). According to Crosby's definition cost of quality is considered as the sum of the costs of compliance are spent to prevent low quality and non- compliance costs are the costs of poor quality created by a defect in the product or service [14].

History of quality management and its cost The foreign literature

1951- Joseph Juran presents the concepts of costing quality, economy of quality and the graphic form of cost of quality model [14].

1956- Armand Feigenbaum presents the modern form of P-A-F model [19].

1978- The first edition of ISO 9000 Standard [quality management principles and terminology] was released to the world by the International Standards Organization [ISO].

1989- Construction Industrial Institute announces the costs relating to the quality of reworks in nine construction projects with total project as equivalent to 12.4% of the total cost of the projects [15].

1995- Johnson presents his suggestions for elements of cost of quality for engineering units [2].

2008- The fourth edition of ISO 9000 was published.

2009- Mills et al announces the costs of failure in construction about 4% of the total cost of the project [8].

2010- Love et al. announce the cost of reworks in the construction of infrastructure projects equivalent to 10% of the total cost of the project [15].

The literature in Iran

Iranian researchers have addressed the productive projects in the field of cost of quality and the cost of quality in construction projects is a new field in Iran and some of them are discussed below:

1983- Analyzing the impact of three factors of cost, quality and time on construction industry by the doctor Habibullah Bayat who has discussed the a result of his research as follows: quality is defined as the compliance with requirements thus first, for the recognition and measurement of quality it is necessary to understand the different aspects of the needs. Second with regard to the long life of the building industry product the quality is not achieved in the absence of foresight. Third, personalized dealing with quality components is doomed to failure. It is necessary to recognize the building components for all buildings by a systematic method and describe the components for cultural, social and climatic conditions of the country.

1998- Design and implementation of quality costing systems in a forging industrial unit by the doctor Kamran Rezaee and Alireza Nikdel that starts with the analysis of administrative procedures in the areas of manufacturing, mold making, quality and finance and they have identified all quality related costs and activities and after defining the elements of costs in each of the main levels and linking different activities

in company with each of them and collecting information and data, they have analyzed the elements of the cost.

2011- The analysis of the costs of quality in manufacturing industry with a focus on mass building projects by Amir Hossein Jafari which is a study conducted on 60 mass building companies according to which the costs of quality is equivalent to 5% of total construction costs.

Classification of cost of quality models

Schiffauerova and Thomson [2006] classified cost of quality models into four general models including: P-A-F or the Crosby Model, cost of opportunity models, cost of process models and activity based costing [ABC] models. They stated that models existing in the same group are not quite the same. In fact, their nature can be different and the proposed classification is made only in accordance with the basic rules and principles [14]. Elements of the abovementioned models are summarized as follows [17].

Table 1. Classification models of cost of quality

General models	Groups of cost of quality
PAF	Prevention + Appraisal + Failure
Crosby	Compliance + non-compliance
Cost of opportunity or invisible costs	Prevention + Appraisal + Failure + Opportunity
	Compliance + non-compliance
	Invisible + visible
cost of process	Compliance + non-compliance
ABC	Double value + without double value

PAF or Crosby model

After studies on the subject matter it is prevention- Appraisal-failure of cost [P-A-F] model is widely accepted and it is the most widely used model to determine and classify costs of quality. P-A-F model is accepted by Quality Control Association of America [7] and Great Britain Standards Institute [17] and used by many companies that have put quality costing on their agenda [18].

Most cost of quality models are based on P-A-F classification. For the analysis based on the phased need to classify each of the factors will be examined. Armand Feigenbaum [1943] performed an analysis of quality costing for the first time when they were developing the system for expense reports with their team. Later in 1951 Joseph Juran developed the concept of quality costing, quality economy and the graphic form of cost of quality model and then Armand Feigenbaum [1956] proposed the modern form of PAF for classification of cost of quality including the costs of prevention, appraisal and failure [including internal and external failure]. Cost classification of Crosby model in 1979 was similar to the P-A-F. Crosby saw quality as "conformance to requirements" and thus defined the cost of quality as the total costs of compliance and non-compliance [13].

Classifying costs of quality

The components of the PAF classification model are defined as follows:

1. Costs of planning, supporting and pursuit of quality:
Including the costs of activities spent to prevent errors and failures in the building. Spending these costs reduce the errors and failure in planning to delivery stages.
2. The costs of quality assessment:
These costs are spent for determination of compliance or non-compliance of the qualitative characteristics of building with the intended characteristics on the maps and technical documents.
3. Internal failure costs (Within the organization)
These costs include the faults that occur at different stages prior to delivery to the customer and the organization through various ways, such as appraisal and testing by quality control department staff or external inspectors to discovers defects and attempts to remove them.
External failure costs (outside the organization)

The group covers costs that arise after delivery to beneficiaries and they are not determined and discovered before utilization by the customer.

The definition of fuzzy variables in MATLAB

For the fuzzy analysis it is needed to classify each of the factors under examination.

In the analysis using Fuzzy Inference System, 4- input variables of construction, quality of materials, engineering knowledge and experience of workers as well as an output variable of cost of quality are defined.

According to the analysis based on fuzzy logic using MATLAB software, it is possible to achieve the desired classification in many ways. Among them the triangular or Trimf is used for middle classification and trapezoidal or Trapmf method is used for border classification.

The materials are classified into three classes with low, medium high quality. The engineers also classified into three categories: amateur, average and professional in terms of experience and knowledge. Labor force includes master, skilled workers and simple workers. The figures related to each classification are presented as follows.

Comparing the traditional model and the dynamic model of costs of quality

After developing the P-A-F model Juran presented the traditional relationship between preventive plus appraisal costs with cost of failure (10). In the P-A-F model, there is a different relationship between costs of quality that plays the key role in understanding the formation of the model [27]. The basic premise of P-A-F model is that addressing the prevention and appraisal activities reduces the costs of failure because the non-compliances will be detected at the earliest possible date [9,20]. Error! Reference source not found. Left Figure presents the traditional theory of the cost of quality and mentions how the cost and quality are linked together.

As it is clear from the Figure there is an inverse relationship between prevention and appraisal of the cost of failure. The optimal level of quality is where the rising curve of the prevention and appraisal costs meets the downward curve. Total costs of quality has the minimum level where the prevention plus appraisal costs is equal with the cost

of failure. The curve of total cost is the sum of two other curves and its minimum point is the optimal point of the cost of quality and thus it is completely dependent on the form of two other charts. This optimal point can be different based on the nature of the project (4).

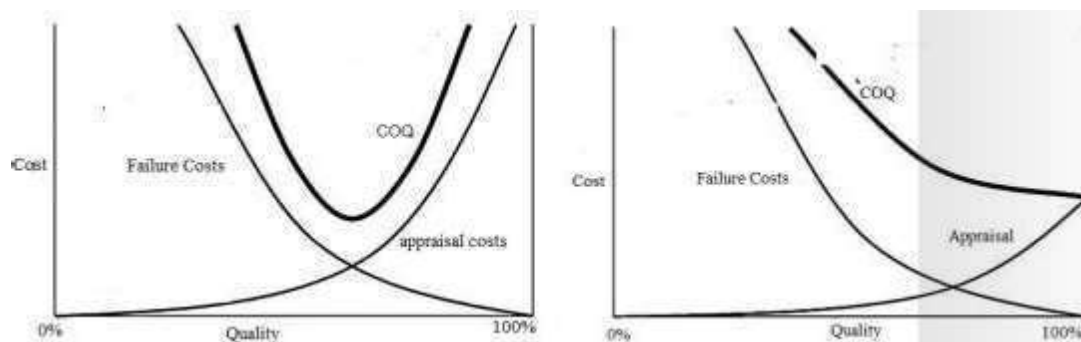


Fig: 1. The dynamic model (right Figure) and traditional model (left Figure) of the cost of quality

(Cost, total costs of quality, cost on compliance, cost on non-compliance, cost of failure, cost of prevention, appraisal, level of quality)

The traditional cost of quality model is appropriate for a specified time and limited conditions and in unlimited circumstances the dynamic model of cost of quality is preferred. In other words, traditional cost-quality relationship is completely correct and reflects the economic cost of quality in static conditions but in dynamic mode, costs of failure can continue to reduce without an increase in cost of appraisal (14). Porter and Rainer (1992) stated that in some situations if enough preventive measures are taken, there will be no defect in the work and thus the cost of failure would be zero and there will be no need for appraisal. In these circumstances the optimal point will be faultless [18]. Error! Reference source not found. The right Figure indicates how it is possible to reduce the costs of failure by addressing the continuous improvement and preventive measures and bring the optimum quality cost to the level of 100%. This model is known as the dynamic model of quality.

According to the code of the design of buildings against earthquake (2800), residential buildings are in buildings with medium importance and thus the quality of 100% is not considered for the construction of a building. Accordingly in this study the traditional model of cost of quality is used and the obtained data are analyzed based on it.

Optimizing the quality costs using Fuzzy Inference System

One of the purposes of quality costing system is to minimize quality costs to the lowest possible. Quality costing could be a growing trend. In other words, as long as the savings and profits from reducing the costs of failure exceed the cost spend for a quality management, extra attention to the quality management is justified [1] To demonstrate the cost of quality features and find the optimal level of significance, many mathematical and economic models have been developed. These models are quite different in terms of purpose but only few of them have practical application [21].

Thus, to achieve a functional model, the collected information is analyzed in MATLAB software and using Mamdani Fuzzy Inference System and then compared to confirm by the traditional curve of the cost of quality.

According to the classifications made on the quality of materials, engineering knowledge and experience of workers 135 rules are defined in the Fuzzy Inference System that finally the level of significance of these rules is defined and defined in [Fig. 2]

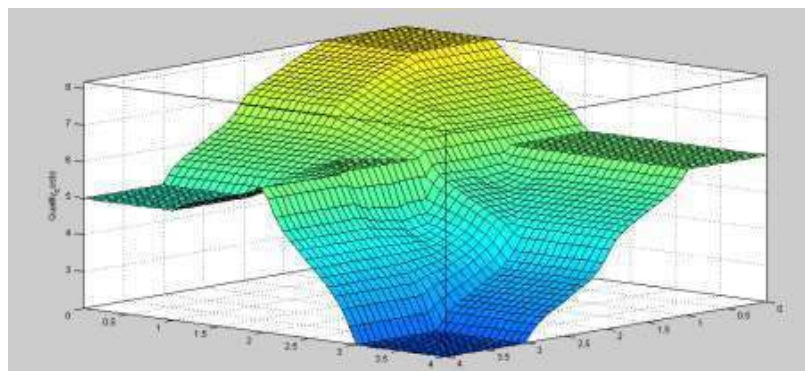


Fig. 2. Level of significance of rules defined in fuzzy inference system

In [Fig. 3], the data obtained from the Fuzzy Inference System and information obtained from questionnaires indicate the relationship between cost and obtained quality based on those expenses. Accordingly it is clear that in order to achieve a quality of 74.9% the lowest cost of quality is about 8.81% and in fact the optimal quality for residential buildings in this range.

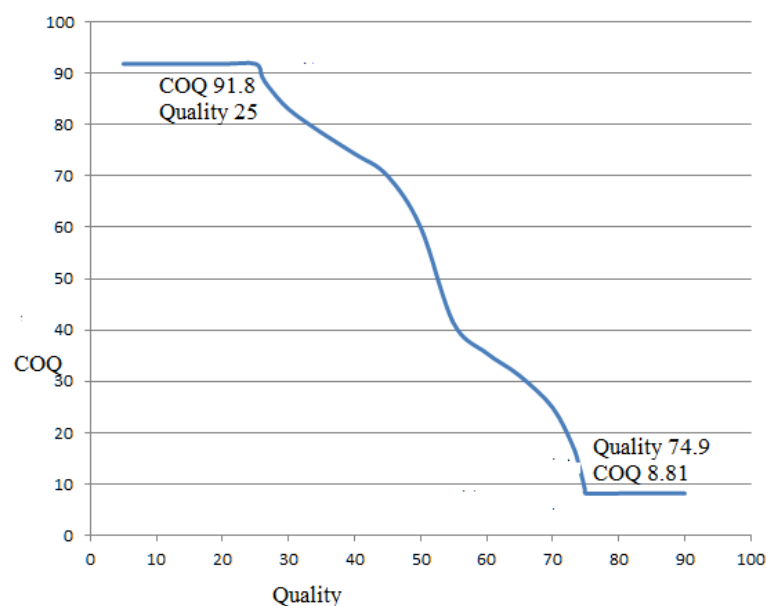


Fig. 3 : Relationship between quality and the cost required to achieve it Cost of quality/ quality

Analysis of the effect of Fuzzy Inference System inputs on the cost of quality

[Fig.4] presents the charts that present the effect of each of the factors listed above one the cost of quality based on fuzzy inference systems. As the Figure 4 suggests and based on the slope of the curves the engineers and workers have the least effect on the costs of quality.

Also the scope of changes in the average cost of quality for each factor is obtained for each of the factors from the number 3 that is the cost of assessing by the contractor to number 6 which is the output failure which presents the proximity of these relations to the cost of quality based on the traditional theory. The relationship between the input variables on the costs of quality indicated the same result. Figure 4 indicates the effect of changes in quality of building materials and expertise of human resources (engineer or worker) on costs of quality. It should be noted that in all these figures the optimal and acceptable sector for cost of quality is the bottom of the cost of quality charts that is specified with a dark blue and includes the quality of above 85%.

As the [Fig. 4] – a suggests the slope of the chart in the building material axis is more than the slope of the chart in the axis of the engineering expertise which indicates the higher effect of the building materials than engineering expertise such that in case of using the low quality materials the costs of quality are tilted towards the costs of internal failure and in case of using the engineers with low expertise these cost of quality lead to the internal failure costs with less slope.

The relatively gentle bilateral slope of this graph that starts with the input quality range of 20% shows the similar effect of these two factors on costs of quality because in the charts of Figure 4-b and c the slope of the graph matching the experiences of workers' axis is far more than engineering expertise or quality of building materials that shows limited range of input factors and this indicates the high effect of these two factors (quality of building materials and engineering expertise) on the costs of quality.

Also according to these two graphs, the slope of the graph in the materials and engineers axis is fixed 50% to the bottom and this means that as the experience of workers in increased in the construction industry it is still not possible to used low quality materials or engineers with little expertise.

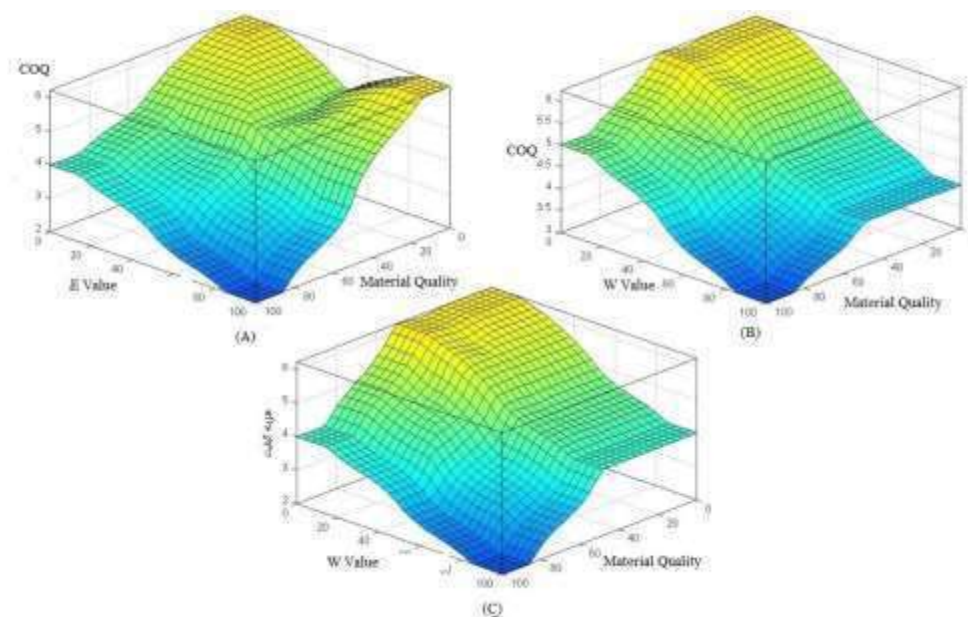


Fig: 4. The three-dimensional charts of the effect of materials and staffing on costs of quality

CONCLUSION

The relationship between the spent cost of quality and obtained quality by those costs. It is clear that in order to obtain a quality of 74.9% the lowest cost of quality for building materials is 8.81% and in fact optimal quality for residential buildings is located within this range. It is also possible to consider 8.81% of the total costs of a building to spend on the costs of quality in terms of manpower.

Also according to the results of this study the following points are mentioned:

- Optimization of costs of quality helps to reduce the negative risks of the project
- Optimization of costs of quality lead to the reduced cost of the entire project, reduced time of implementation of the project and improved construction quality

- Investment on the costs of compliance helps to reduce the cost of non-compliance
- Based on the results of this research achieving the optimum point of the costs of quality in construction projects is achievable by following the classical charts of the costs of quality

CONFLICT OF INTEREST

Authors declare no conflict of interest.

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REFERENCES

- [1] Measuring Design and Construction Cost of quality. Davis, K., Ledbetter, W. and Burati, J 1 989, Journal of Construction Engineering and Management, p. 115.
- [2] The Development of Measures of the Cost of Quality for an Engineering Unit. Johnson, M. 1,995th, International Journal of Quality and reliability Management, pp. 86-100.
- [3] Quantifying the Causes and Costs of Rework in Construction. Love, P. and Li, H. the 2 thousandth, Construction Management and Economics, pp. 479-490.
- [4] A Cost of Quality Analysis of a Building Project: Toward a Complete Methodology for Design and Build. Hall, M. and Tamkins, C. the 2,001th, Construction Management and Economics, pp. 727-740.
- [5] Is a cost of quality system for you? Corradi, P. 1,994th, National Productivity Review, pp. 257-269.
- [6] Principles of Cost of quality. Campanella, J. 1,990, ASQC Quality Press.
- [7] A Process Approach in measuring cost of quality of construction projects: Model Development, International Journal of Quality and reliability development, 20 pp: four hundred seventy-nine to four hundred and ninety-two Aoieng, R., Tang, S. and Ahmed, S.
- [8] Cost of quality in Dubai: An analytical case study of residential construction projects. Abdelsalam, H. and Grad, M. 2009, International Journal of Project Management, Vol. 27: 501-511.
- [9] Quality-Related Costing: Findings from an Industry-Based Research Study. Plunkett J, Dale B. 1,998th, Engineering Management International, pp. 247- 257.
- [10] Quality Control Handbook. Juran, J. 1951st, New York: McGraw-Hill.
- [11] Cost-based Analysis of Quality in Developing Countries: A Case Study of Building Projects. Kazaz, A., Birgonul, M. and Ulubeily, S. in 2005, Building and Environment, 40, pp. 1356-1365.
- [12] Quality Planning and Analysis, 3rd Edition. Juran, J. and Gryna, F. the 1,993th, New York: McGraw-Hill.
- [13] Quality is free. Crosby, P. 1979, McGraw-Hill.
- [14] A Review of Research on Cost of Quality Models and Best Practices. Schiffauerova, A. and Thomson, V. 2 006, International Journal of Quality and Reliability Management.
- [15] The Effect of Project Types on the Occurrence of Rework in Expanding Economy. Oyewobi, L., et al., Et al. 2,011, Journal of Civil Engineering and Construction Technology, pp. 119-124.
- [16] Rework in Civil Infrastructure Projects: Determination of Cost Predictors. Love, P., et al., Et al. Two thousand and ten, Journal of Construction Engineering and Management, p. 136.
- [17] Measuring the impact and the results of using the costs of quality tools- A Case Study in the suppliers of car parts, Hosseini Ashtiani M, Rezai , Kamran and Communion , Massoud , Master's thesis, Tehran University ,[2002]
- [18] Strategic approach to housing and urban development in the country, Ghalibaf, Mohammad Bagher, Tehran, Institute of thinking and dynamic action
- [19] Total Quality Control, Feigenbaum, A. [1961] New York: McGraw-Hill.

ARTICLE

EXPLAINING EFFECTS OF STRATEGIC FACTORS ON ORGANIZATIONAL PERFORMANCE THROUGH ENTREPRENEURSHIP IN MANUFACTURING COMPANIES AT GILAN PROVINCE

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ABSTRACT

Nowadays, attentions are drawn to strategic factors, innovation, and learning in organizations which produce wealth, and competitive advantages. Entrepreneurship creates organizational learning and allows strategic innovation in organization that lead to improve performance. This study aims to investigate role of strategic factors on organizational performance through entrepreneurship in manufacturing companies at Gilan province. The research method was descriptive and correlational. In the research, 131 companies are selected as sample using random convenience sampling. Using simple and multiple regression models, we investigate role of strategic factors on organizational performance through entrepreneurship. The findings imply that strategic factors impact on organizational performance positively, and any test results show that whole of components related to strategic factors have significant relation with entrepreneurship at relevant companies at 95% level. Organizational performance has same relation with entrepreneurship. As well as, strategic factors impact on organizational performance through entrepreneurship positively.

INTRODUCTION

In this high-competitive era, organizations are faced with environment which has increased complexity, globalization, and dynamism. It is generally confirmed that a value is achieved by improving organizational performance persistently leads to dynamism [1]. In the organization field, for decades, researchers argue that performance is discovery and exportation at the same time. Also, performance is defined as trying to survival and dedicating time and energy to discover resources in order to future survival [2]. Organizational performance relies on performance of human resources and their interaction with resources, facilities, and technology in the organization [3]. Nowadays, attentions are drawn to strategic factors, innovation, and learning in organizations which produce wealth, and competitive advantages. Entrepreneurship creates organizational learning and allows strategic innovation in organization that lead to improve performance. Since 1950 decade, growing global competition, economic developments, and technologic advancements result in fundamental changes in the inter-organization systems. Strategic factors, structure, and generally inside of organization were considered by researchers. Changing external forces result in changing in demands to industrial and consumable products and services. After understanding instability and role of environment on their fate, organizations adjust themselves with it. In this regard, many studies and evidences imply successful organizations (performance) have higher attention than unsuccessful one to environment [4]. Manufacturing companies as a most prominent economic institute have important role on economic and commercial activities so that reinforce economic development infrastructure [5]. Garcia et al. (2006) showed that in order to achieve a desired level of organizational performance and improve it, we must reinforce different strategic capabilities. They said that abilities and capacities must be created, integrated, and configured. This requires integration of some strategic factors and capabilities including individual dominance, transformational leadership, common ideals, proactiveness, and environment. According to them, strategic factors lead to deal with rapidly changing environment, increase competitive advantages, and improve organizational performance [6]. According to above discussion, this study aims to examine strategic factors which influencing on organizational performance through entrepreneurship. These factors are tested using simple linear and multiple regression equations. In the next sections, we review theoretical basics about strategic factors, entrepreneurship, and organizational performance. Then, we present a framework to relate strategic influencing factors and organizational performance. As well as, methodology is discussed and finally, findings, applied concepts, and research limitations are presented.

Theoretical Basics and Conceptual Model

Organizational Performance

Organizations improve themselves persistently to survive and progress in today competitive world. Performance is referred to how conduct tasks, activities, and their results [8]. Schermerhorn et al. argue that performance is referred to quality and amount of individual and collective achievements [7]. According to Armstrong, performance is a strategy that based on fundamental analysis and achieved performance levels [6]. Organizational Performance (OP) is how conduct tasks, activities, and their results. In other words, organizational performance can be defined as measurable results of organization decisions and actions. It shows amount of goals achievement. In fact, it can be defined as indicator to measure achievement level of effective and good actions toward defined tasks. Organizational performance can be evaluated through organizational effectiveness and efficiency to meet goals [3].

KEY WORDS

Organizational
Performance,
Entrepreneurship,
Strategic Management,
Transformational
Leadership

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Organizational performance is resulted from operational processes of organization. Performance is abilities of organization not only to increase their competitiveness but also maintain competitive position in comparison to rivals [6]. Organizational performance is defined as integration of economic performance at any moment to form a long-term indicator. In the organization field, for decades, researchers argue that performance is discovery and exportation at the same time. Also, performance is defined as trying to survival and dedicating time and energy to discover resources in order to future survival [2]. It can be defined as organizational achievement across time, and its abilities to meet environment and other stakeholders' demands [4]. Organizational performance relies on performance of human resources and their interaction with resources, facilities, and technology in the organization [8]. In this research, performance organizational is the dependent variable and measured by compare organizational performance with main rivals.

Entrepreneurship

In the new era, competition for resources and capitals are very common. Big industrial countries, winners of the competition, are focused on resource and capital productivity and with their educated and expert people help them to develop and innovate. This innovation, which based on entrepreneurship leads to revive economy of developed countries [9]. Entrepreneurship leads to increase economic growth as it drive community toward innovative and technical changes. Also, it has high importance due to it convert new knowledge to new product and service. In addition to employment, it improves quality of life, distributes income properly, and decline social anxiety, and increase financial resource efficiency. Entrepreneurship is a new technical-economic phenomenon which transforms world, economics, and industry across two decades ago. Today, our country has shortages and mismanagement which lead to unemployment, low GDP, declined state investment, defected non-oil exports and so on, with glimpse to global economy, it can be said that entrepreneurship and its culture is a sole way to revive today economy and prevent declining future economy. Of course, we must employ it cleverly and adjust it based on our culture, facilities, abilities, and tastes [10]. Deracker argue that entrepreneurship requires employing management concepts and techniques, product standardization, employing tools and designing plan based on learning and analysis. He defined it as a particular attributes in the people [11]. Kerzner, a professor of New York university, explain it as follows: "entrepreneurship means that more mutual compliance and coordination in operations of markets" [12]. It is a process which leads to satisfaction or a new demand [16]. Entrepreneurship is a process value-creating by forming a unique set of resources in order to take advantage an opportunity [13]. According to Col, it is a purposeful activity which leads to improve or maintain economic unit through individual or collective decisions. On the other side, He argues that entrepreneurship culture is emanated from risk-taking, opportunity tracking, and needs meeting through innovation and establishing a business. Batist defined entrepreneurship as to improve resource efficiency [14]. Josef Shompiter argues that innovation is resulted from entrepreneurship and it required a person with extraordinary attributes. This person must aims to build a private territory and have motivation to resolve problems and his pleasure at skill creating and employing to become an entrepreneur [15]. Stivenson et al. argue that entrepreneurship is a process in which opportunities are tracked for self or its organization regardless resources [16]. Timones define it as ability to create and build a valuable thing from nothing. It can be defined as launching, handling, and achieving, and founding a company or an organization [2]. Hisrich assume entrepreneurship process as to create a new something which requires spending much time and efforts and taking financial, mental, and social risk. Finally, it leads to acquire financial resource, personal satisfaction, and independence. This results from arranged activities which bridges between creativity and innovation with market requirements and opportunities. In other words, entrepreneurship is not creating a new product and service, but this product must be appropriate to market needs and demands [17]. Common features of entrepreneurship definitions are: responsibility, economic, risk-taking, value creating, using environment possibilities, combinational form, rationality, manufacturing nature, self-reliance, self-confidence, organizing, voluntariness, binding, creativeness, and perseverance [10]. In this research, entrepreneurship is mediator variable which measured based on factors such as organizational learning and innovation. We must provide necessary conditions for humans to create a culture which encourage innovative orientation. Different definitions on innovation are presented in organizational studies. Novelty and imitative are main aspects of innovation definitions [6]. Organizational learning is defined as collective capabilities, based on experience and cognition, include knowledge acquiring, sharing, and employing. Due to importance of innovation effects on organization, researchers emphasize growing attention toward organizational learning, which have key role in the organizational innovation. It is assumed that learning is a key factor allows companies to acquire information quickly and flexible innovation process [18].

Strategic factors impacting on organizational performance

Today, organizations are faced growing challenges as unexpected trends across political, social, cultural, and technological aspects are coming. This forces organizations to permanently and quickly acquire new strategic competitive advantages and as such overtake rivals [19]. Strategies are set of processes and decisions which human made and effective use of them ensure that strategic and financial issues are lowest [20]. Strategy in first sense is a mental concept. This means that all strategies are abstract. Any strategy is an innovation, which emanated from individual imagination. It be whether objectives to arrange a conduct or analogical patterns to describe a occurred conduct [21].

- Strategy is a common perspective between members of an organization or a group, which based on their objectives and/or actions.

- Strategies are tools which allow company achieve long-term objectives.
- Strategy is a unit, comprehensive, and combined plan which allow organization to achieve main objectives.
- Strategy is an action period investigated by top managers intently.
- Strategy is a descriptive analysis of challenges complexity and real organizational phenomenon, therefore it ease conceptualization.

It can be said that there isn't unique definition for strategy; we have many definition for it. Strategy is an action and decision pattern which occurs out of time. Efficient strategy is determined by managers prior or emerged based on decisions and actions of relevant group at once. Organizational strategy has a prominent feature, integration. This means that it include most parts of organization and impact of them. Menitzberg points that strategy employed in the different formats such as formal plan, deception of rivals, position in the costumers mind, perspectives of staffs and other concepts. However, in all cases, organizational decisions and actions patterns are clear [21]. In this research, independent variable is strategic factors, which is defined as set of capabilities which lead to deal with rapidly changing environment, increase competitive advantages, and improve organizational performance. These factors are measured by components such as individual dominance, transformational leadership, common ideals, proactiveness, and environment [6]. In the new organizations, peoples reinforce themselves and have individual dominance, which means self-enhancing, concentration, and re-enhancing [3]. Individual dominance, learning, and personal capacities developing leads to more desired results and creates organizational environment in which all peoples try their capabilities to achieve their desired objectives [6]. Confident peoples should gain intellectual, research, problem-solving, and social skills and must tolerate ambiguity. They have responsibilities to gain knowledge and confidence. As well as, they give important information to others, improve their skills, improve their positions in organization by gaining new skills, and discover and employ their capabilities [15]. Experimental research confirm that transformational leadership increase efficiency and valuable information, which lead to improve organizational performance. Transformational leadership is committed to develop and promote human resource professionally. Therefore, leader as diver of innovative culture and distributor of knowledge in the organization pursuit best organizational performance and impacts on it through entrepreneurial culture, knowledge management, flexibility, human resource management, and increased human capital [6,3]. Common ideals mean shared perspective and insight between members of organization. Common ideals can unit whole organization in the unified climate. These ideals are resulted from collective learning which created by strategic level of organization and required by operational learning. Management must balance authority and resource to lead staffs and create collective identity. Therefore, a new identity is emerged with common ideals and collective arranged operation [10]. Proactiveness is organizational capabilities to promote changes and developments and response to events, which include gaining initiative. Proactiveness is prediction of forces and conditions, which impact on organization. It tries to control environment rather than adapt with it [6]. Environment effects on strategy, structure, and generally inside of organization has been considered by researchers. hanging external forces result in changing in demands to industrial and consumable products and services. After understanding instability and role of environment on their fate, organizations adjust themselves with it. In this regard, many studies and evidences imply successful organizations (performance) have higher attention than unsuccessful one to environment [10]. This is environment that determine amount of progressiveness required by competitiveness, and main source of opportunities and threats and organizations try adapting themselves with it. Environment can be rather stable or ambiguous, hostile and complicated [6].

Model and research hypotheses

Garcia et al. (2006) suggest that we can use strategic factors including individual dominance, transformational leadership, common ideals, proactiveness, and environment to improve organizational performance. They show that in order to achieve a desired level of organizational performance and improve it, we must reinforce different strategic capabilities. They said that abilities and capacities must be created, integrated, and configured. This requires integration of some strategic factors and capabilities which lead to deal with rapidly changing environment, increase competitive advantages, and improve organizational performance. These strategic capabilities and factors and their relations improve organizational entrepreneurship by positive impact on organizational innovation and learning, therefore, they improve organizational performance through entrepreneurship [6].

Figure 1 shows research model.

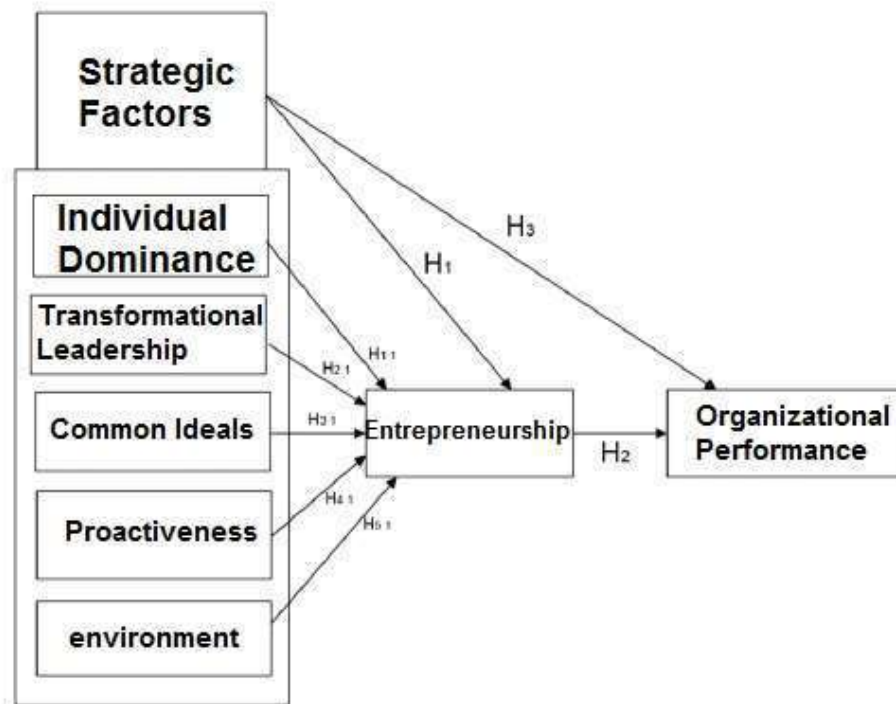


Fig 1. Conceptual model of research (Garcia-Morales et al., 2006)

According to the variables, and research method, hypotheses are as follows:

Hypotheses 1: strategic factors impact on entrepreneurship positively in manufacturing companies at Gilan province.

Hypotheses 1.1: individual dominance impact on entrepreneurship positively in manufacturing companies at Gilan province.

Hypotheses 1.2: transformational leadership impact on entrepreneurship positively in manufacturing companies at Gilan province.

Hypotheses 1.3: common ideals impact on entrepreneurship positively in manufacturing companies at Gilan province.

Hypotheses 1.4: proactiveness impact on entrepreneurship positively in manufacturing companies at Gilan province.

Hypotheses 1.5: environment impact on entrepreneurship positively in manufacturing companies at Gilan province.

Hypotheses 2: entrepreneurship impact on organizational performance positively in manufacturing companies at Gilan province.

Hypotheses 3: strategic factors impact on organizational performance positively in manufacturing companies at Gilan province through entrepreneurship

METHOD

The research method is descriptive and correlational in which correlation between criterion and predictor variables are showed. In regard to monitoring and control level, this is field research as variables are investigated naturally. In regard to objectives, this is applied research and hypotheses are evaluated at 95 % confidence level. Statistical population was manufacturing companies at Gilan province. Among this, after preliminary study on 30 companies and determining standard deviation, sample size is evaluated 131 using Cochran formula a 5% error rate and precision equaled to 0.11. In the research, simple random method is used to sample data. A questionnaire is used to collect data which has 3 sections. Section 1 includes questions about strategic factors including five components and 20 questions are used to evaluate those factors (item 1 to 20). These questions are adapted from Garcia's (2006) standard questionnaire. In this section, respondents were asked to rate questionnaire with a Likert's 7 points scale (1=fully Agree, 7=fully disagree). In section 2, questions related to entrepreneurship are presented. This section has 2 components and to measure those, we propose 11 questions (item 21 to 31) based on Garcia (2006) standard questionnaire. In this section, respondents were asked to rate questionnaire with a Likert's 7 points scale (1=fully Agree, 7=fully disagree). In section 3, we used 2 components with 13

questions (item 32 to 44) to measure organizational performance based on Garcia (2006). Again, respondents were asked to rate questionnaire with a Likert's 7 points scale (1=fully Agree, 7=fully disagree). Questions related to theoretical basics are proposed based on details of any variables and experts were consulted to examine reliability of questionnaire. Then, we distributed it. Therefore, question reliability are confirmed formally. To determine reliability of questionnaire, Cronbach's alpha was used based on below [Table 1].

Table 1: Reliability of variables based on Cronbach's alpha coefficient

Variables	Chronbach's Alpha	Number of Questions
Strategic Factors	90.1	20
Entrepreneurship	94.5	11
Organizational Performance	96	13

In second stage, linear and multiple regression equations in Spss 22 are used to whether confirm or reject hypotheses.

FINDINGS

In the [Table 2], mean, standard deviation, and variance of variables are presented. As you can see, strategic common ideals has highest mean and organizational financial performance has lowest one.

Table 2: Descriptive statistical findings

Research Variables	Mean	Standard Deviation	Variance
Strategic individual dominance	5.0191	0.45524	0.207
Transformational leadership	4.9623	0.52154	0.272
Strategic common ideals	5.0248	0.43401	0.188
Strategic proactiveness	4.7805	0.77138	0.595
Strategic environment	4.7542	0.61856	0.383
Strategic factors	4.8315	0.40299	0.162
Organizational Innovation	4.6197	0.77141	0.595
Organizational learning	4.6286	0.62901	0.396
Entrepreneurship	4.6325	0.68964	0.576
Organizational financial performance	4.6180	0.54929	0.302
Organizational performance in comparison to rivals	4.6697	0.50553	0.256
Organizational performance	4.6536	0.51001	0.260

After that we tested normality of primary variables distribution using Kolmogorov-Smirnov test in order to use parametric test, Pearson's correlational coefficient test are used to measure correlation between variables. According to correlational coefficient in table 3, it can be found that correlation between variables is less than 0.05 and it can be said that variables are related significantly with 95% confidence level.

Table 3: Summary of correlational coefficient matrix between variables

Research Variables	Strategic Factors	Entrepreneurship	Organizational Performance
Organizational Factors	1		
Entrepreneurship		1	
Organizational Performance			1

In the [Table 4], we present test results of hypotheses. As you can see, all hypotheses are confirmed.

Table 4: Summary of results from analyzing research data using regression equations method

Hypothesis	Predictor	Criterion Variable	Regression Coefficient	Standard Deviation	Durbin-Watson	Significant Relation	Results
H1	Strategic Factors	Entrepreneurship	0.922	0.121	2.170	Yes	Confirmed
H1 1	Individual Dominance	Entrepreneurship	0.955	0.082	2.125	Yes	Confirmed
H2 1	Transformational Leadership	Entrepreneurship	0.833	0.134	1.661	Yes	Confirmed
H3 1	Common Ideals	Entrepreneurship	0.878	0.13	1.826	Yes	Confirmed
H4 1	Proactiveness	Entrepreneurship	0.799	0.098	1.723	Yes	Confirmed
H4 1	Environment	Entrepreneurship	0.684	0.148	1.792	Yes	Confirmed
H2	Entrepreneurship	Organizational Performance	0.887	0.32636	1.859	Yes	Confirmed
H3	Strategic Factors	Organizational Performance	0.883	0.24794	1.881	Yes	Confirmed

CONCLUSION

This research attempts to examine effects of strategic factors in organizational performance. The results imply that strategic factors such as individual dominance, transformational leadership, common ideals, proactiveness, and environment through entrepreneurship indicator have direct and indirect effects on organizational performance.

It is suggested that manufacturing companies' managers can improve skills, competencies, and abilities of their staffs and increase their self-confidence, and create motivation as driver of qualified staffs toward to efficiency and achievement. Therefore, they can increase individual dominance of staffs. Managers should state attractive comments, and reinforce positive attitude in staffs. They should see staffs' reaction and express feeling based on positive motivation emotions of staff. Also, they should identify clear landscape, goal, and missions for company so that staffs can understand those and have commitment and interest. These should be general principles and main criteria to design and implement programs and more importantly, they should be based on creativity and innovation to guild business strategies properly. Also, companies must integrate with their environment to maintain their competitiveness and innovativeness.

This harmony implies that companies must have potential to learn, unlearn, and relearn. Organizational learning allow organization to understand and interpret environment and develop appropriate strategies to deal with it.

CONFLICT OF INTEREST

Authors declare no conflict of interest.

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REFERENCES

- [1] Schiua, Giovanni, & Lerro, Antonio, 2008, Intellectual capital and company performance Improvement, Measuring business Excellence, Vol.12, No.9-2,3
- [2] Bumagarden, Peter, Nickerson, Jorjia, & Zenger Todd, 2012, Sailing into the wind: Exploring the relationship among ambidextrity, vacillation, and organizational performance, Strategic Management Journal, Vol.33, 610-587.
- [3] Ho, Lee schitt, [2008] What affects organizational performance? The Linking of learning and Knowledge management, Industrial management & data systemsml.10, No. .1254-9, 1234 .
- [4] Akrivou, Kleio H, [2011, Executive catalysts: Predicting Sustainable organizational performance amid complex demans, The Leadership Qarterly, Vol..1009-22, 95
- [5] ashtiani, alireza, 2010, organizational innovation in companies, monthly Bandar darya.
- [6] Pimswadi, Lorena, & Digman, Lousi, [2012, the impact of porters strategies utilized o the level of E-commerce adopted by large service enterprises in Thailand, International Journal, 15(2) .123-117 .
- [7] GarciaMoales, Viktor, Liorens-Montes, Francisco, & Verdu_Jover, SAntonio, 2006, Antecedents and consequences of rganizationalinnovatin and organizational learning in entrepreeurship, Industria Management& Data Systems, Vol.106, No.1, .42-21 .
- [8] alam tabriz, akbar, haj baba, ali, rajabi fard, iman, 2010, intellectual capital, publications state management training center and industrial research of iran, first edition, tehran.
- [9] ahmadpoor daryani, mohamad, [2010] entrepreneurship, publishers pardis, ninth edition, tehran
- [10] dehghanpor, ali, 2012, entrepreneurship & entrepreneurs, quarterly industry, number 19, pp.50-53.
- [11] Mazzorol, Tim, & Rebout, Simoon, 2006, The strategic decision making of entrepreneurship within small high innovator firms, INT entrepreneurship management journal, Vol.2, No.2, .280-261 .
- [12] Gateory, Drugs, Dess, Gorj, Lumpkin, Jon, Covin Jeffrey G, [2011, entrepreneurial strategy mking nd frm performance: Tests of contingency and configurationaly models, strategic management journal, Vol. 18, No. , -677 695 .
- [13] Ireland, Robert, Covin, Jeffrey G, & Kuratko, Donald F, 2009, Conceptualizing corporate entrepreneurship strategy, Entrepreneurship theory and practice, 33 mNo.1, .4-19 .
- [14] samad aghaei, jalil, 2012, entrepreneurial organization, publications state management training center, tehran.
- [15] Ireland, Robert, 2013, Strategy entrepreneurship, Strategic entrepreneurship management journal, Vol.3, No.10-1, 7.
- [16] histrich, rabert, peters, michael, 2011, entrepreneurship, fey zbakhsh, seyed alireza, taghiyari, hamidreza, publishers sharif university of technology, first 1, fifth edition, tehran.
- [17] Jimenez, Dimina, & Valle, Ranz, 2011, Hnnovation, organizational learning, and performance Journal of business research, Vol.64, .417-408 .
- [18] sanjaghi, mohad ebrahim, farahi boozjani, borzoo, hoseyni sarkhosh, seyed mahdi, 2011, the impact of transformational leadership on organizational culture and organizational commitment in a defense organization, jurnal of defense strategy, ninth year, number 1&2 , pp 75-82. .
- [19] Akbar Bhatti, Waheed, Zaheer, Arshad, & Ur Rehman, Kashi, 2011, The effect of knowledge management practices on organizational performance: A conceptual study, African Journal of Business Management, .5, 2853-7, 2847
- [20] safarzadeh, hoseyn, tadayon, azam, hormohamadi, maryam, 2012, the effect of knowledge management strategies on innovation and organizational performance, quarterly tolooe behdasht yazd, eleventh year, pp76-86.
- [21] azvaji, alaedin, 2007, developments cultural entrepreneurship with emphasis on the publishing industry, research institute of culture and Art, first edition, tehran
- [22] Covin Jeffrey, Miles, Monroe, [2012] corporate entrepreneurship and pursuit of competitive advantage Entrepreneurhp theory and practice, 23 (3) .63-47 .

ARTICLE

THE RELATIONSHIP BETWEEN SOCIAL CAPITALS AND TEAM WORK AMONG TEHRAN'S TEACHERS (SOCIOLOGY OF TEACHERS)

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ABSTRACT

The studies so far have been on the sociology of institution of education and its functions. However, there has been little attention to the teachers; in other words, the sociology of education has been approved, not the sociology of teachers. Now, is it possible to see the teachers as social capital and evaluate this large social group from this perspective? The most important purpose of the present study is to investigate different dimensions of teachers as social capital, namely cognitive, structural, and relational dimensions and their effects on team activities of teachers. The main hypothesis of the research is: "There is a relationship between social capital of teachers and their team activities. The statistical society of the study included teachers of the city of Tehran as well as citizens of Tehran that 420 people were selected from each group by the stratified random method. The instrument for data collection was an author-made questionnaire using key indices, the validity of which had been confirmed by experts and the reliability of which had been confirmed to be 0.78. Following the data collection, the hypothesis of the study was confirmed. The cognitive dimension of teachers had the greatest and the structural dimension had the lowest impact on the social capital of teachers and their participation in team activities. Also, willingness to take part in teamwork was proved to be higher in teachers in primary schools than the teachers in secondary schools. Also, with respect to the job status, among 40 jobs, teachers got the score of 68/33 out of 100. The most important suggestion of the author in the first step is to improve the view of teachers, managers, and assistants towards group and team teaching in schools (Lesson Study) and a serious decision should be made by executives to heighten the social status of teachers.

INTRODUCTION

Infection Social relationships can be considered as one of the most important components of social capital or the most important source of social capital. By a more concise look, it can be said that this very important source is the essence of the relationships of people in social institutions and organizations including education institution. But the point is discovering and reinforcing these relationships.

In other words, this precious gem is hidden in the relationships among people and even some people are unaware of its existence and importance. But when the importance of these relationships in resolving or improving the main issues of any organization or institution becomes clear, people and organizations will find out its importance as well.

Trust among people is also another aspect of social capital. Without trust, people and institutions cannot improve their issues. In other words, trust-based relationships can make ground for creating a power to improve the external and internal issues of people and organizations.

By relationships among people we don't mean the superficial relationships, but we mean those relationships which lead to the synergy of personal powers as a collective power to improve the issues. In order to better explain the problem and with respect to institution of education, we should ask a question: "Haven't been any relationships among teachers?"

The answer is: by relationships among teachers we don't mean ordinary relationships. They have always been there and are still there. But the ordinary relationships cannot resolve the problems of class, lessons and school and only those relationships can be considered as social capital that are along with trust and create a power to resolve or at least improve the problems of lessons, class, and school.

Since the author himself is a member of board in the University of Farhangian (teacher training) and is familiar with the methods of teacher training as well as collaboration among teachers in teaching and learning, by concise studies about social capital and education system, he has found three points in this regard: 1) so far the studies have been about the sociology of institution of education and its functions. But there has been little attention to the teachers and in other words, so far much attention has been toward the sociology of education rather than the sociology of teachers. Now, is it possible to consider teachers as social capital and evaluate this large group from this perspective? 2) Summing up all the studies regarding social capital, we can conclude that social capital is a latent potential created in the relationships among teachers which facilitates things and accelerates achieving to the goals. The question is: how much is this

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capital among teachers and how it can help to improve the problems of education and assist teachers to resolve the problems of lessons?

One of the most recent teaching methods which has been considered by educational experts in the USA, Europe, Japan ... since the early 20th century and its effectiveness has been confirmed in various field studies, is Lesson-study (team and collaborative teaching). Team teaching is usually used to teach important complicated subjects; in this method two or more teachers are present in the class simultaneously and teach the subject collaboratively by observing each other. This method facilitates and accelerates the process of teaching-learning and leads to deepening of learning. But realizing this requires more and better relationships among the teachers. In the light of these team activities they can resolve problems which they couldn't solve lonely and this is what sociologists call social capital.

According to these three points, the first spark and starting point from which the author is going to express the issue has become clear.

Definitely the quantity and quality of the relationships among people in any institution and organization may affect efficiency and effectiveness of people as well as that organization or institution and is a main base for achieving individual and organizational success. It is one of the essential prerequisites for development and improvement in the society and is considered by researchers and experts as social capital.

The importance of training human resources as the most important factor affecting economic development is clear to everyone. The question is who trains these people. The answer is, the future makers of the society are now being trained and educated by teachers; in other words, teachers make the future of the society and they can be called architectures of the society.

The importance of the present study lies in the question that how much we know the architectures of our society.

How much do the sociologists who claim they know the society well, actually know the architectures (teachers) of their society? Have they written to or taken a step toward knowing the teachers of the country more deeply and correctly?

The group of teachers is one of the largest and most effective groups in the society. The number of the members of this group is considerable compared to other social roles (more than one million teachers), and they are notable in sociology studies due to their influence on the families.

Since teachers are considered as the most important social capital, cultural executives and planners of education should know this large organized power in the first place and use it to improve cultural and educational issues.

The author believes that one of the major reasons of failure of cultural and educational institutions in achieving their goals is that they don't know the teachers of their society and are unaware of their latent precious potentials.

Therefore, the sociology of teachers and knowing this social group more concisely to apply this potential in order to improve sociocultural issues seems to be a necessity. In the present study, the relationship between different aspects of social capital and team activities of teachers is investigated.

Fukuyama believes that education is an area in which governments use their most abilities to create social capital, since educational institutions not only transfer human capital, but also transfer social capital in the form of social rules and norms (Fukuyama, Cited by Nasiri, 2008: 120).

In the thought and opinion of many experts, the cognitive dimension of social capital is seen as one of the most effective dimensions in forming social capital. Some of the main components of this aspect include values, attitudes, and norms and the schools are known as the most effective institutions in these components.

Billante and Sanders (2002) who consider personal respect as the background for emergence and durability of social capital point out that since education plays an important role in socialization of any generation, schools have a basic part in any policy making aiming at reinforcing respect (Billante and Sanders, 2002: 30).

Putnam believes that social capital forms the development of children effectively. Trust, networks, and norms of cooperation among families, schools, peer groups, and the larger community in which children are living have considerable effects on them achieving their opportunities and choices and hence influence their behavior and progress (Putnam, cited by Azizi and Ghayumi, 2015: 59 and Rabiei, 2004, 64). The present study aims at investigating cognitive, structural, and relational aspects of social capital and the effect of social capital on team activities of teachers.

In other words, this study is going to answer the following questions: Is it possible to measure and evaluate cognitive, structural, and relational dimensions of teachers? Is there any relationship between social capital and team activities of teachers?

The purpose of the study

The overall purpose of the present study is to identify cognitive, structural, and relational dimensions of teachers as one of the most important aspects of social capital (and recognizing the components of each of these dimensions) and to investigate the relationship among different aspects of it and the relational conditions and teamwork of teachers, aiming at knowing teachers as one of the largest social groups (the sociology of teachers).

Theoretical foundations

Hanifan (1916) was the president of the schools of Virginia, USA at that time. He refers to the notion of social capital in describing the importance of collaboration in increasing the efficiency of schools: something tangible having the greatest impact on the life of people, like good will, friendship, sympathy, and social communication among people and families making the social unity... if the one communicates with their neighbors and the neighbors communicate with other neighbors, a social density will be created which may immediately fulfill the needs of society and has probably the potential to be adequate to improve life conditions fundamentally (Mousavi and Alipour, 2012: 13).

The article by L. G. Hanifan in 1916 about the local support for rural schools was one of the first times of using the phrase social capital (Hanifan, 1916: 130). Coleman (1988) attracted the attentions toward the importance of social capital by his studies about cooperation at school. He points out: social capital is defined through its function and has two common features: it has aspects of a social structure and facilitates particular action by the people inside the structure (Coleman, 1994: 302).

Coleman considers the social capital as the perfect example of a public good which is created by a group of people not only for those whose efforts to create it have been effective, but also for all people in that structure (Coleman, 1988: 116).

James Coleman, the leading American sociologist having a great impact on the studies about education, has had a greater effect on the notion of social capital than Bourdieu. Through studies about educational success in minority areas, he showed that social capital is not merely limited to the powerful, but may be useful for the poor and marginal communities as well. In Coleman's eyes social capital indicates a source. (John Field, 2007: 38).

Consequently, Coleman performs a series of experimental studies about learning in private schools compared to public ones and reports that the students of Catholic schools as well as schools with other religious affiliations have better performance, even taking account of other factors such as social class and ethnicity; he concludes that communities are main resources of social capital. (ibid: 42)

Bourdieu says, "social capital is the collection of physical and spiritual resources allowing an individual or a group to have a sustainable network of more or less institutionalized relationships for mutual familiarity and cognition" (Bourdieu, 1992: 119).

Putnam defines social capital by three components: a) networks: like other social capital theorists, Putnam introduces the social relationships between people and their interactions together as the most fundamental element of social capital. b) Social trust: it is another component of social capital. And c) cooperative norms: Putnam sees it as the criterion for social capital, like that colleagues switch their days off to each other. Putnam's focus is more on cognitive aspects of social capital (Putnam, 2000: 134).

The theoretical foundations in team activities of teachers (lesson study)

One of the studies performed about cooperative teaching by teachers was in the educational year 1995-96 in the country Japan entitled "The most effective plan to train teachers in schools of Japan professionally".

This is a case study investigating the process of cooperative research in mathematics class in the primary school of Komno in the city Nagoya and the effect of cooperative teaching on improvement of teaching-learning process, educational activities at the schools and enhancement of professional merits of teachers has been explored.

This study aimed at investigating cooperative teaching of teachers in class (lesson study) and its effect on improvement of learning and educating professional teachers. For data collection, the researcher has used observation and interview, reports, and documentations and observed and recorded every activity using audiovisual recorders to explain the process of cooperative teaching in a scientifically objective way (Sarkar Arani, 2010: 68).

Teachers obtain opportunities in the process of cooperative study to work together, have group evaluation of the educational behavior of each other, practice teamwork methods, exchange their opinions together, and learn from each other and study the educational problems of the school in a cooperative process. In this way teachers learn from each other and add to their professional abilities (Sarkar Arani, 2010: 68-80).

Cooperation is not only for students, and the teachers can benefit from cooperation with their counterparts as well. If possible, it is sometimes better to teach in groups. It means that two or more teachers teach in one class at the same time. It is not easy, but it is very great. These teachers observe the classes of each other and give feedback to each other. They can record the lesson audio-visually and then get the records heard by the group. Of course the observers should be trained to consider what aspects of the class while observing. Then, a meeting should be held so that the observers may compare their notes. It is good to include assistant teachers, volunteer parents, and others in cooperative group of teachers (Jacob, cited by Mortazavi and Vahdani, 2011: 213).

Cooperativity of the study in classes leads to balance of self-criticism in individual teachers, suggesting that improved education is a process of team act, not an individual scope of responsibility. This indicates that when Japanese teachers design a lesson cooperatively together, they consider the result as a joint product belonging to every member of the group. When a teacher teaches a lesson and others observe her, the possible problems are usually attributed to the lesson designed by the group, not the teacher who is performing it. So it is possible for teachers to criticize their colleague without offending her. Therefore, it will be possible to talk about the merits and defects of the class and the process of reviewing and improving it more deeply and concisely (ibid, p: 133).

What caused Japanese teachers to emphasize on performing and continuing lesson study, was that lesson study was based on collective wisdom which is certainly more advantageous than individual wisdom. They also learned each other's experiences as well as facilitating and deepening their students' learning. Another important point is that theories are usually studied and tested in laboratories and the best place to test the efficiency of educational theories is real lesson classes, as Japanese teachers implemented the theory of teaching based on collective wisdom practically in their classes and was able to overcome the problems of how to transfer knowledge, concepts, and skills to their students (which other teachers try to realize lonely) and prove efficiency of team teaching.

Following Japan, in countries like Germany, the US, China, Singapore, Australia, UK, and Malaysia lesson-study has been considered by education experts.

In Iran also it has been considered in recent years, and somehow actions have been done in order to make some teachers familiar with lesson study method, although the efforts have not been succeed in making the majority of teachers familiar with this lifesaving prescription to improve teaching-learning process, and it has yet a long way to achieve change in teachers' attitudes and implementing this method.

Teachers obtain opportunities in cooperative teaching process to work together, have team evaluations of the educational behavior of each other, practice teamwork, exchange their views, and learn from each other. In fact, cooperative research by teachers in class is the most effective study while practicing and has a great impact on improvement of education in schools and training professional teachers. Literature shows that one of the most important effective factors in teacher training is their study in the class and their relationship to the students (Yushimoto, cited by Sarkar Arani, 2010: 68).

This method helps teachers while obtaining professional merits, rebuild their thoughts and pay considerable attention to extension of relationships and interactions of students with them (ibid: 69).

MATERIALS AND METHODS

Methodology and type of the study

The present study is an applied research according to its purpose, and the methodology is descriptive-survey. Since in the present study the author is trying to describe and explore the cognitive, structural, and relational aspects of social capital of teachers and the degree of their willingness to do team and team activities (lesson study), as it is without any manipulation through a field survey. Yet, in explaining the theoretical framework of the study we used a documentary method.

Statistical society of the study

The statistical population of the study includes male and female teachers in the city Tehran. The total statistics of teachers of the city Tehran, separately for all areas, was taken from Deputy of research, planning and human resources of the city Tehran in educational year of 2015-2016 and the sample volume has been calculated accordingly.

Sample volume and sampling method

Sample volume was calculated using Cochran's sample volume (Sadei, 2006: 71) and was considered as 384 people. For the sake of assurance, this number was increased to 420 people.

According to the extent of the city Tehran, the sample was first selected through cluster sampling from northern, southern, eastern, western, and central zones, namely the zones number 1, 16, 8, 9, and 11 of the city, and then the sample in every zone was selected through stratified random method according to the educational course and gender.

Data collection instruments

The main instruments for data collection are

1. Inventory of measuring dimensions (cognitive, structural, and relational) of social capital
2. Inventory of willingness of teachers to team activities (lesson study)
3. Inventory for measuring social position of teachers from the perspective of people

Findings

1. The social capital of teachers was measured through 60 items in three dimensions (cognitive, structural, and relational) and the following results were obtained:

Table 1: the results of social capital of teachers

Amount of Social capital	Frequency	Percentage
High	234	55.71%
Medium	123	29.28%
Low	63	15%
Total	420	100%

According to the obtained results, the amount of social capital was high in 55.71%, medium in 29.28%, and low in 15% of teachers. It means that in sum 85% of the teachers in Tehran have social capitals higher than the average amount.

2. To measure the cognitive dimension we used four components: a) religious and national values, b) attitudes toward teaching job, c) commitment and honesty in teaching job, and d) degree of teachers' trust in the people around them; totally 18 items were used to measure this dimension and the following results were obtained:

Table 2: The results obtained from distribution of respondents according to the cognitive dimension of social capital

Cognitive dimension of social capital	Frequency	Percentage
High	284	67.61%
Medium	104	24.76%
Low	32	7.61%
Total	420	100%

According to the results, the amount of cognitive dimension of social capital is high in 67.61%, medium in 24.76%, and low in 7.61% of the teachers. It indicates that in sum, the cognitive dimension of social capital was higher than the average amount in 92.37% of the teachers in Tehran.

3. To measure the structural dimension of social capital we used three components in a total of 14 items: a) degree of accountability of the manager of schools, b) degree of clarity in decision-making, and c) degree of collaboration in the school. The following results were obtained:

Table 3: The results of distribution of respondents with regard to the structural dimension of social capital

Structural dimension of social capital	Frequency	Percentage
High	186	44.28%
Medium	136	32.38%

Low	98	23.33%
Total	420	100%

According to the above results, the structural dimension of social capital is high in 44.28%, medium in 32.38%, and low in 23.333% of the teachers, as they evaluated it. It indicates that generally the score of the structural dimension of social capital in schools is lower than that of other dimensions of social capital.

4. In order to measure the relational dimension of social capital we used 7 components consisting of 28 items: a) family relationships, b) kinships, c) relationships with friends, d) relationships with neighbors, e) relationships with councils, f) relationships with associations, and g) corporate relationships. The following results were obtained:

Table 4:

Relational dimension of social capital	Frequency	Percentage
High	232	55.23%
Medium	129	30.71%
Low	59	14.04%
Total	420	100%

According to the above results, relational dimension of social capital is high in 55.23%, medium in 30.71%, and low in 14.04% of the teachers in the city Tehran. It indicates that 85.94% of the teachers in this city are higher than average amount with regard to relational dimension of social capital.

5. To measure the amount of willingness of the teachers to take part in team and team activities (lesson study) we used 10 items and the following results were obtained:

Table 5: The results of distribution of respondents regarding the amount of team activities

Team activities (lesson study)	Frequency	Percentage
High	203	48.33%
Medium	146	34.76%
Low	71	16.90%
Total	420	100%

According to the above results, willingness to take part in team activities (lesson study) was high in 48.33%, medium in 34.76%, and low in 16.90%. It indicates that 73% of the teachers are willing to take part in team activities.

Testing hypotheses

Multivariate regression analysis

Researcher may create a linear relationship between independent variables and dependent variable through multivariate regression, and investigate the relationships between independent variables in this way. At this time we have used step by step multivariate analysis in order to investigate spontaneous effects of independent variables on the dependent variable.

Table 6: The results of multivariate step by step regression analysis

Predicting variables	R	R ² adj	β	T	Sig-T	F	Sig-F
Social capital	0.869	0.725	0.817	24.172	0.000	402.135	0.000
Social capital Cognitive dimension	0.936	0.738	.0131	11.277	0.000	659.49	0.000
Social capital Cognitive dimension Structural dimension	0.948	0.741	0.163	7.119	0.000	721.23	0.000
Social capital Cognitive dimension Structural dimension Relational dimension	0.925	0.765	0.109	4.203	0.000	892.56	0.000

First stage: At this stage the first predicting variable, willingness of teachers to take part in team activities (lesson study), i.e. social capital was placed into the regression equation. It means that this variable in itself explains 72% of the variance of team activities (lesson study) by teachers. While beta coefficient (0.817) shows that there is a direct relationship between these two variables.

Stage 2: In the second phase cognitive dimension was placed into the regression equation and the power of prediction was added by 1.3 following entering it. Meanwhile beta coefficient (0.131) shows that there is direct correlation between this variable and the dependent variable.

Stage 3: In the third phase structural dimension was included. By inclusion of this variable only about 0.3 was added to the power of prediction. And beta coefficient (0.163) indicates a direct correlation between this variable and the dependent variable.

Stage 4: In the fourth phase relational dimension was included in regression equation and added to the power of prediction by 2.4. Beta coefficient (0.109) shows a direct correlation between this variable and the dependent variable.

The results obtained from multivariate regression analysis indicate that the above four variables together explain 76.5% of the changes in the dependent variable and the rest should be sought in other factors (like economic and living conditions, educational and education assistance facilities ...), the investigation of which is recommended to other researchers.

DISCUSSION AND CONCLUSION

1. All the research hypotheses are confirmed following data collection. But cognitive dimension had the greatest and the structural dimension had the least impact on social capital of teachers and their participation in team activities which indicates that the teachers themselves have a good attitude toward team activities. But the structure and organization of the schools haven't been able to offer this opportunity to the teachers. The most important structural factor is the method of management in the school. In other words, rather than trying to improve the quality of education and optimize the teaching-learning process, managers try to resolve physical and constructional problems, a fact that may be clearly observed by analyzing the time spent by the managers during educational hours.

This result is consistent with the findings by Ahmadi (2013). In his study also the role of cognitive dimension was greater than the structural and relational dimension. This finding is also consistent with the finding by Afshar Kabiri (2003).

2. Social capital in female teachers is higher than male teachers. And the significance test confirms this result.

This finding is consistent with the results of the study by Radmehr (2007). In his study by contrast, the social capital was higher in male teachers. Of course it must be noted that Radmehr performed his study only in one zone (zone 11 in Tehran) on the teachers in secondary schools. While the statistical society of the present study included all the teachers in secondary and primary schools in the city Tehran.

3. Willingness of female teachers to take part in team activities is higher than male teachers and the significance test confirms it.

This finding is consistent with the findings by Radmehr (2007), in which social participation of female teachers was higher compared to male teachers.

4. There is no significant difference between social capital of teachers in different zones of the city Tehran. But willingness of the teachers in southern areas to take part in teamwork (lesson study) was higher than that of teachers in northern areas and the significance test confirmed this.

5. Social capital in primary school teachers is higher than that in secondary school teachers. Also willingness to take part in team activities is higher in the teachers in primary schools. The significance test confirmed this finding.

This finding was consistent with the results of the study by Rahimi Saghand (2011) in which social capital was higher in the teachers in lower courses.

6. There is no significant difference between education level and social capital. Also there is no significance difference between education level and participation in team activities.

This finding is consistent with the results of the study by Rahimi Saghand (2011). In his study the relationship between level of education and social capital of teachers has not been confirmed as well.

7. Social capital is higher in married teachers compared to the single ones. But with regard to willingness for team activities, there is no significance difference between married and single teachers.

This result is consistent with the findings by Rahimi Saghand (2011) in which social capital was shown to be higher in married teachers than the single ones.

8. The relationship between age and social capital is not significant statistically. However, social capital is shown to be of higher value in older teachers. But as they get older, their willingness to take part in team activities.

Part of this finding is different with the findings by Rahimi Saghand (2011). There was a relationship between age and social capital teachers in the study by Rahimi Saghand. His research also showed that as the teachers get older their job satisfaction reduces and this study shows that as the teachers get older, their willingness to take part in team activities reduces.

9. There is a significant relationship between experience and social capital, i.e. the more the years of experience, the higher the social capital. But there is no significant relationship between years of experience and willingness for team activities.

This is the same as the results found by Rahimi Saghandi (2011). He also found a positive significant relationship between years of experience and social capital.

The reason why social capital is focused more than other types of capital such as economic capital, physical capital ..., is that without social capital, it is not possible to use other kinds of capital efficiently and social capital increases the efficiency of other kinds of capital.

The quality of the relationships among people as social capital is much more important when the human resources of an institution (like institution of education) are training the human resource of other institutions in the society.

Hence, teachers as the core trainers of human resources should themselves have a high quality so that they can add to the quality and development of human resources of other social institutions. But one factor impacting quality and efficiency of teachers is relational conditions of teachers (their team activities).

Since teachers are one of the most important kinds of capital in developing societies, it must be noted that only motivated teachers can encourage their students to learn more and better and in this way add to the quality and efficiency of work force and smoothen the way to development. In contrast, teachers without motivation with poor relational conditions, decrease the rate of achieving development directly (by superficial teaching) or indirectly (by lacking happiness and exhilaration).

In sum, it should be said that in light of the relationships among people, there will be capital which may be used both for economic growth and development and improving educational issues.

CONFLICT OF INTEREST

There is no conflict of interest.

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None

REFERENCES

- [1] Tamin M. [2012] translated by Abd-ol-Hussain Nik Gohar, Tehran, Toutia publications, second edition
- [2] Jacob et al. [2011] cooperation in learning, translated by Seyed Hassan Mortazavi and Muhammad Reza Vahdani, Tehran, Roshd Publications, first edition
- [3] Rabiei K. [2004] one-player game, Tehran, Ministry of culture and Islamic guidance, the monthly of social sciences. 89-8
- [4] Sadei A. [2006] research methodology and statistics, Tehran, Shalak publications, first edition.
- [5] Sarkar A, Muhammad R. [2010] culture of teaching and learning, Tehran, Madreseh Publications, second edition
- [6] Azizi M, Ghayumi AA. [2015] The role of social capital in cooperation and cultural activities, Tehran, Eshagh publication, third edition.
- [7] GhafariGholam R. [2011] social capital and disciplinary security, Tehran, Publication of sociologists.
- [8] Field John. [2013] Social capital, translated by Gholm Reza Ghaffari, Hussain Ramezani, Tehran, Kavir Publications, third edition.
- [9] Mousavi MT, Alipour P. [2012] a reflection on the theory of social capital in sociology, Tehran, Publications of sociologists, first edition.
- [10] IRIB media measurement center. [1996] a survey of the people of Tehran about the employment status of the jobs with serial number. 240: 1997/1/8.
- [11] Nasiri Morteza. [2008] social capital and its impact on general policy-making, Tehran, the institute of cultural and social studies, first edition
- [12] Billante N, Saunders P. [2002] Six Questions About Civility, Centere for -Independent Studies. 82.
- [13] Bourdieu P, Wacquant L. [1992] An Invitation to Reflexive Sociology, Chicago, University of Chicago Press.
- [14] Coleman James S. [1988] Social Capital in the Creation of Human Capital, The American Journal of Sociology. 94:95 -120.
- [15] Colema James S, Donald J, Treiman. [1994] Foundation of Social Theory, Belknap Press, Cambridge MA.
- [16] Hanifan LJ. [1916] The rural school community center. Annals of the American Academy of Political and Social Science 67: 130-138.

- [17] Mary G, Powers JJ, Hoimberg, Occupational Status Scores, Changes latroduced by the inclusion of Woman, Demography. 1978:188.
- [18] Putnam, Robert D. [2000] Bowling alone: the collapse and revival of American community, New York: Simon and Schuster.
- [19] Robert H, Divid F. The Process of Stratification, New York, Academic Press. 1977:17.
- [20] Yoshimoto J. [1998] Kyoshi no Shishitsu to WaNanika, [What is Teacher Competency?], Nihon Kyoiku Keiei Gakai Kiyo [*Journal of Japanese Assosiation for the Study of Educational Administration*]. 28:2-11.

ARTICLE

A MODEL FOR COMPETENCY ASSESSMENT OF THE FACULTY IN THE ISLAMIC AZAD UNIVERSITY

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ABSTRACT

Today country success in economic, social, political, cultural and ... tendencies are the hostages and pawns of coherent and dynamic didactic system and approved. The education and didactic programs for qualification improvement and dynamism need to evaluate and scrutiny quantitatively and qualitatively. Current study started with the goal of presenting faculty competency evaluation for the reason of qualitative improvement of Islamic azad university. Research in term of how to collected and compilation the datais descriptive- survey and in term of goal and target type is practical that by doing general scrutiny in literature and subject history and past, we drewed the theoretical frame and conceptual model in this study. Nominee educational members opinions (faculty members (self- assessment), supervisors (superiors), students (clients) of Fars stat Islamic Azad different universities, are the research society. In this research with researcher evaluation in 24 active units in fars state, approximately 125000 presons examined. That sample volume selected by the clustered random sampling method (kerjesi and Morgan formula), 380 persons, for the reason of collecting dates we used a researcher questionnaire that its validity confirmed by the specialists and its stability calculated by using the kronbakh,s alfa method 0.84. Researche questionnaire includes effective component in competency in five general axis, collects the datas. Then with using 360 degree evaluation method, executed. For the data analysis me used descriptive statistic method and elicitation statistic (fact oral analysis, vilkakson and Friedman) that the results of the study as follows: 1. drawing the model of competency evaluation of faculty (main dimension of evaluation indexes of faculty competency's). 2. in the field of evaluation of current situation from the dimensions and competence skill parameters, ethical values, role, personal, favorable status exists. But in the performance and functional dimension and its subcomponents unfavorable status and lower than average level evaluated and the results of ranking of evaluation of dimensions of competency's of faculty in order the most priority is related to skill dimension and the least priority is related functional and performance dimension

INTRODUCTION

According to society gradual conversion to knowledge base society, social request for know ledge and skills has increased. And universities throughout the world inevitable have spreads qualitatively and quantitatively. [1] With growing the importance of higher education (palpitate heart and society development motor) and its high development in societies and doing various apostolate, the more of the have reached the point that university means faculty. This work led to decrease the options level of faculty and also power of the faculty in the main operation of the university. [2] so faculty as a undertaking main educational pillar and effective in the higher education system operation and its targets substantiation counts. In the other hand, education system of every country by accompanishing with evaluation, research, examination processes can be able to protect and develop the performance and effectiveness and answerable to needs of labor market and accountable to labor market, and accountable to procedure of growth of economical, social, cultural pillars of society. Thus faculty evaluations is a way to increase the universities quality and societies progress and develop.

Evaluation is an aspect and of course important aspect of educational activities, and we can realize the shortcomings and strengths points of the educational plans and offer suitable solutions to solve the educational plan problems. [3]

In this case teacher evaluation is a important strategy for education quality improve, attractive for the universities, for this reason, higher education centers determin some criterion for detecting the teacher competency and hereby and in this way, with a good process will evaluate the performance of them. Pundits have offered that for final augmentation, pay attention to different aspects of evaluation that the affair needs a general pattern. [4]

Jirouk and coworkers have scurried the evaluation reliability and validity of teachers from students and got this result that students evaluation depends to teachers coaching ability and detectable teaching ability and detectable teaching skills. [5]

It's necessary to have faculty competency model for hinting employment, instruction and evaluation in the universities, and can be framework for management in the basis of competency in organization for improvement. A competency evaluation pattern includes table of competency's that are prepared from looking at satisfactory performance for an special job. This pattern can detect the competency's that persons should develop for improving the performance in their current job and, or for promotion or transferring to the other jobs. This pattern also can, in skills fracture analysis, means compartment between available competency's and needed competency's, be profitable [6, 7]

Texts scrutiny shows that special evaluation model for faculty competency evaluation in the higher education system of Iran does not exist and the important benefits are as the follows:

KEY WORDS

competency, faculty, evaluation

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Level and size of vocational and personal competency in the higher education system can be determined prepress a framework to evaluate their performance quality. Prepress limits to employ new ones. [8]

Basis for vocational and personal growth

Can from strategically plans for general system and reference system (Islamic azad university and Iran higher education system) and huge system of country.

The role of higher education in country development is so important (societies development motor). Main component of the universities is faculty. [9]

The faculty competency levels have a lot of affections on higher education performance. Faculty competency's influence on learning level, progress, and satisfactory of the students according to qualitative problems of Iran higher education and cheap upper cases, the researcher likes to draw and illustrate the faculty evaluation model in the Islamic al in the country. [10] The data's of the model are useable for all zones of decision and in this way in the future we will see qualitative progress in the higher education system of Iran and the various problems decrease the wishing goal of this study, is to promote higher education quality in Iran by making the faculty competency evaluation model in the Islamic azad university. [11]

History

The most important done insider and out siders evaluations in the study subject are as the follows:

Robert and colleagues (2009) believe that the teaching competencies of the members of the faculty are included with seven dimensions: to prepare favorable learning environment, to get involve the students actively, know ledge evaluation, students skill and view, easy access to the educational goals for the students, giving the feedback to the students, competency level awareness, self- teaching ability awareness, self-directed training and lifetime learning. [12]

Vishan: six skill dimensions: vocational know (edge, planning for teaching and education, execution of educational strategies, resource and manpower management , student learning level evaluation, vocational responsibility are the important skills for effective teaching. [13]

Patrice and smart believe that effectiveness of the faculty members in the classroom, includes various dimensions, that includes sole dimension like: to respect to the students, ability to challenge the students, mind stimulation of the students, lesson organization, speech skills, representation of reviewing the lectures. [14]

Zachary smith gained the competency parameters from fact oral analysis . He refined in the basis of reviewing the texts, primary study, feedback from elites, questionnaire in this corrected competency model on the basis of empirical datas for higher education leader presented. [15]

This model presents fire distinct and separate competency dimension: (HELC)

1. Analytical dimension
2. Communications
3. Affairs related to the student-dimension.
4. Behavioral relationship dimension.
5. External relationship dimension

Analytical competency's

w.brad. jonson (2003) presented triangular structure competency for teacher. This model includes three main components:

1. dntical / operational competency
2. Behavioral or personal competency
3. Cognitive/ knowledge competency
4. Ethical competency

Miller (2006) believes types of competence are Necessary for university professors, as follows:

- A. Technical competence and ability.
(science and skill in teaching lessen)
- B. Vocational competence and ability. (Plan awareness, educational and evaluation and presentation)
- c. [16] personal and sole competence (personal properties effective behavior in training and upbringing process)

cambró john in a study with the subject : worldwide view on educational goal , teaching and evaluation goal gain the results that world higher educational system going through quality of faculty member teaching .so it is required to make the mechanisms for evaluating the teaching quality in a standard mode. One of the important index of education evaluation is the faculty teaching quality. [17]

Hojjati, z approved that evaluation of members of faculty for teaching quality has more importance because making professional forces for the future generation requires strong faculty in the universities which either in the education and their in research own knowledge, view , conversance.

Reputation and reliability of higher education institutes depend on reliability and performance of their faculties workers performance evaluation influences on efficiency level promotion. [18]

Jebeli illustrated that effort and stimulus of professors and teachers of university, in the case that exist an index for comparing themselves to the other colleagues is better and more favorable. Whereas lack of these systems has resulted that there is no difference between performances of professors and their salaries and benefits. And at the result of that, the better performance stimulus decreases. [19] Human resources performance is the main pillar to protect and survive any organization.

Bazargan showed that universities as the organizations that have the goal to make professional and special human resource beside and next to producing science, more than any other organization requires to evaluate their faculty members performance. Faculty evaluation results appearing the weakness and strength points and is the start to science development and achieving university goals.

Araste proved that a general system and a precise system of faculty members performance evaluation can have favorable various effects such as: education requirements determination human resources requirements, how to promote, sway and benefits determination of faculty members. [20, 21]

Study question

1. What are the main parameters of faculty competency evaluation model at Islamic azad university system?
2. How much are the parameters at current status of faculty of Islamic azad university?
3. How much is the coordination degree of offered model in specialists opinion?

MATERIALS AND METHODS

Statistic society, sample, method of sampling

Type of target of this study is practical, and how to collect the data is descriptive – evaluating . according to this subject that the goal of this subject that the goal of this study is practical scientific knowledge, the researches practical. [22, 23]

With paying attention to the goal of this study which is compiling a model for evaluating the faculty competency in first region (zone=number 1) of Islamic Azad university, the standardizing and compiling of these dimensions are at the local level. because the researcher uses 360 degree feedback evaluating method, the statistic society of the study forms by educational stakeholders opinions (faculty members (examed) , supervisors (group managers, educational assistants), students), students (clients) in various Fars state units of Islamic Azad universities that with primary researcher evaluations at 24 active units at Fars state it became approximately 125000 persons. In this study , korjesi and morganas formula is used to determine the sample volume and for primary evaluation, 380 persons is estimated. To select statistical samples, local random sampling method is used. First Fars state was divided to 5 zone, north, east, west, south and center and then between the related units of each zone selected the members of the wanted sampling society by using random sampling methods. [24] Following [Table 1] shows zones and sample size in selected units:

Table 1: Zones and sample size in selected units

Geographic zone	Selected units	Statistic sampling volume	percent	Sample Size
North	Abade	28047	21.5	82
South	Larestan	16958	16	60
East	Neiriz	26170	20.5	78
West	Shiraz	41510	28	107
Center	jahrom	12811	14	53
total		125496	100	380

Data collecting tools (validity and reliability)

Researcher questionnaire is used to collect the data's, in this study so in the direction of the goals a questionnaire is marked and performed. and performed. If is required to mention that internet network is

used to determine the faculty competency evaluations and dimensions, with considering the past studies and researches and professors opinion and specialists, and to search in databases. [25]

And factors and parameters as a research questionnaire is defined. For one by one of the parameters some index as a sub parameter is considered, total of indexes is 5 main dimensions at 110 secondary parameter validity of measurement tool is the other important items in the method of research. Reliability of the measurement tool determined nominal by using item analyze. [26]

For nominal validity we consult with professors and specialists and brought their opinions in the questionnaire eleven professor and specialist confirmed and verified the validity of the tool containing. Furthermore, to assure from tool structure validity, after collecting the data's, we evaluated with fact oral analysis. The results gained from item analysis are in the 3.3 [Table 2].

We can see easily that all evaluation tool items of faculty competences in the organization is between 0.54 to 0.62 and at the meaningful level is 0.0001. [27] And with the total grade of the faculty competences have positive relation and meaningful relation that illustrate high validity of these items.

Table 2: Tool validity for faculty competency's

row	Sab parameter	validity	Meaningful ness level
1	Performance	0.55-0.65	Meaning fullness level
2	Skill	0.48-0.56	0.0001
3	Ethical	0.54-0.60	0.0001
4	Role	0.48-0.56	0.0001
5	Personal and sole	0.55-0.65	0.0001
	Total grade	0.54-0.62	0.0001

One of the important, subjects in the study method, is stability of the measurement tool. Measurement tool stability is a degree that gained result could be resulted from repeating measurements. In the other word, to use measurement tool in the same statuses and situations, the to evaluate the questionnaire reliability, kronbakh Alfa test is used. This test calculates the internal harmony in the questionnaire. At this method after using spss software, kronbakh Alfa test was calculated. [28]

First 30 question naire was distributed between some persons of statistical society randomly. And at 2 week distance time and again the questionnaire was given to them.

And then after using kronbakh Alfa, reliability coordinate was calculated. The results of questionair test performing, showed that questionnaire questions have high kronbakh coordinate. The results relate to kronbakh Alfa test are in 4.3. [Table 3]

Table 3: Kronbakh Alfa results table

parameters	1	2	3	4	5	summation
Reliability coordinate	0.79	0.83	0.93	0.76	0.86	0.84

This table shows that the questions in the question naire, were in the direction and subject of the study and had good containing

Data analysis

After making questionnaire's and collecting the answers, to analyze the gained datas we used the descriptive statistic methods like, abundance, abundance percent, abundance percent graph standard average, elicitation statistic (factor araliysis, Wilkinson and Friedman). Data analysis processes and statistical tests was done by spss 19 software. [29]

Discussion and interpretation:

First study question

What are the main parameters of faculty competency evaluation at Islamic Azad university system?

For answering above question, with scrutiny

The subject literature and history and past, five main dimensions of competency with special approach of this study defined, its parameters by factor analysis test (bartlet test, know, subscriptions [Fig. 1], component rotated matrix, factor naming) detected that indexes or its sub parameters as follows:

The collected swabs were cultured on blood agar and Mac Conkey's agar [Fig. 2]. The agar plates were incubated at 37°C for 24 hours. Gram staining was used to examine the morphology and staining reaction of the organisms. Biochemical evaluation included testing for catalase, coagulase, bile, oxidase, triple sugar iron, indole and citrate using standard prescribed protocols for identification and characterization of microorganisms. Methicillin resistance in *Staphylococcus* species were tested with the help of cefoxitin disc and oxacillin disk (Hi-Media Ltd, Mumbai, India) on Mueller Hinton agar by using Central Laboratory

Standard Institutional (CLSI) guidelines. Antibiotic sensitivity testing was done by using Kirby Bauer's disc diffusion method as has been described in the CLSI guidelines 2011[6].



Fig. 1: Component rotated matrix, factor naming

Performance dimension

Parameter 1: educational planning

Indexes

- Ability to plan on the basis of orders and students scientific expectations.
- Ability to plan to get evolve students knowledge, skills, thinking processes.
- Using strategies and suitable processes and various evaluations on educational plan.
- Preparing the education physical environment according to education type and learning type.
- Plan to use technology as a tool to increase learning.
- Using the university references and society references that support students to learn on educational plan.
- Using empirical educations that urges the student for versatility, flexibility, being consumed, creativity. [30]

Parameter 2: leading the education

Indexes:

- Effective resources management ability to stable education development
- Detecting ability for various learning methods.
- Harmonizing ability for stakeholders in university to access to high standards as a result for education.
- To detect the causes of students misbehavior and doing something to correct it.
- Supporting the standard upbringing and education on vocational development activities.
- Presenting multiple learning opportunities, suitable for any persons.
- Managing ability and educational study guiding determine the habits to learn longtime.

Parameter 3: educational organizing

Indexes

- * having skill to create learn- educate environment for effective learning
- * Using multiple intelligent theory and information ethnology effect on educating and learning.
- * learning strategies developing ability. [31]

parameter4: education evaluation

Indexes:

- Ability to use error concepts and valid concepts of evaluation to make or choose the evaluation
- Skill to choose the methods for suitable evaluation for educations related to teaching
- Skill to tell the evacuation results to the student and the others

Parameter 5: consultation

Indexes:

- Ability to analyze and recognize questions, problems and deduction
- Ability to experiment or feel all human emotions like sadness, hope luck and serendipity feel , sincerity
- Ability to speech in the mass, speech in front of the others

Parameter 6: education control

- * Making the standards for students behaviors in a class.
- * Detecting and or developing a system for record class progress and each student progress.

Parameter 7: researching

- * Having politic and researching ethic
- * Ability to cooperate and to make the researching networks.
- * Ability to reinforce the researching competency's, specially related to effectiveness and interdisciplinary studies

Skill dimension

Parameter 1: perceptual

- Ability to percept and analyze the complex grower problems
- Ability to percept the environmental problems and to recognize and analyze inter and outer environmental
- Mind and physical ability
- To recognize and percept self-status for realizing the organization goal and targets.

Parameter 2: human

- Ability to communicate friendly
- Ability to solve the group problems and preparing cooperative environment between students.
- Ability to making good relations with all persons.

Parameter 3: Technical (knowledge and awareness)

- Awareness of physical and social development patterns between studnts.
- Ability to detect knowledge and or students skill for educational goals by using detect test, watching and student's mote.
- Choosing and developing cases needed and required in order to educational goals , student's learning needs.

Parameter 4: problem solving.

- Ability to define the question.
- Ability to make substitution AL solvations
- Ability to decide about what is the best solvation.
- Ability to performing and executing the solutions and evaluate the results.
- Ability to finish the solution and resulting and conclusion.

Parameter 5: goal making

- Ability to make operational challenging goal
- Ability to harmonize short time and longtime goals.
- Ability to harmonize previous goals with new conditions and new data's

Ethical dimension

Parameter 1: belief

- Paying attention to religious believes at work
- Working in the way of god satisfactory
- Considering god in all affairs
- Obligation to good and prohibition to bad, believes
- Origin of the universe and the other world after death belief
- Responsibility in front of god and Islam

Parameter 2: Islamic behavior

- Having Islamic ethics in the university environment
- Attention to Islamic ethics and government Islamic values.

Parameter 3: responsibility

- Being at the correct time at sessions, appointments, classes
- Responsible o do the work duty
- Sensible to the organization further and fate.
- Seriousness, speed, in the works and jobs

Parameter 4: Islamic educational environment reinforcement.

- Trying to perform fundamentals of religious and belief
- Trying to train the Goodman's
- Trying to prepare good environment for religious training and university ethical growth
- Trying to transform to practical Muslim teacher pattern.

Parameter 5: justice

- Behavior in the justice way are equal to all students and colleagues
- Considering the rights and performing the justice
- Respecting to self- rights and the others rights.

Role dimension

Parameter 1: decision

- Using awareness procedure and logical procedure at the decision
- To be calm at quick decisions
- Consulting to the others for deciding
- Thinking about the future and seeing all the advantages and disadvantages of got decisions.
- Having stronger precept to answering and being responsible to decisions and works.

Parameter 2: Critics management

- Ability to plan to prevent in the conditions of the time before critic.
- Ability to organize and manage the resources that are required to answer to the critics.
- Ability to form and lead the critic team.
- To helping the others after solution of the critic
- Ability to make the executing orders versus the critics
- Ability to communicate to stakeholders to inform them, the critic results and affections

Parameter 3: relation and communication

- Ability to give the data in a special subject logically
- Ability to right simply and logically in the suitable formation and structure and easy to understand to all readers
- Ability to read, study, percept, the special cases interpret communication and group work skill

Parameter 4: information

- Effective performing of all rules, orders
- Using valid and various data references
- Using data's to learn in the lifetime
- Propagating the data's effected and useable

Personal dimension and sole dimension

Parameter 1: stimulus

- Feeling safe and there's nothing to worry about the mistakes
- Ability to finish the started jobs
- Job and position of job satisfactory
- Doing work and jobs alone and solely

Parameter 2: creativity and invention

- Being comfortable with changes
- Ability to design the environment that stimulates creativity and new thoughts
- Showing creativity and invention intelligence to increase the level of invention.

Parameter 3: elites gift from god

- Ability to percept comprehension and resulting and deduction and proving the texts
- Ability to percept the text interconceptual and education and analysis them
- Ability to find the correlations and rules between changing parameters
- Ability to do numerical method calculations and mathematics

Parameter 4: self – management

- Having the special goals righted to perform

- Self-encourage, after successful jobs
- Thinking to self beliefs and self-assumptions when the conditions are hard
- To open the assumptions and evaluating them in case of regretting by the others

Parameter 5: compatibility

- Job condition sati's factory and unlike to changing the job
- Ability to accept leader role and duty at social, planning, and juicing the person's work as a session boss, team group

RESULTS

In the case, compatibility of results in this study with last research results is compared

As we mentioned, we detected five main dimensions for the faculty competency's that include parameters and sub parameters and like history and literature of the study, the results of same studies in the outside and inside of the boundaries of Iran in this field as follows:

It's necessary to mention, the advantages of this study, are views and new vies to defining faculty competency's using 360 degree feedback , that are compeletly updated and suitable for current status of our country. [32]

1. In the first dimension case of faculty competency model that is performance:

Seven parameters: planning , leading, organizing, monitoring, evaluation , consultation, researching by help of fact oral analysis are defined that after evaluating the history we realized that upper parameters in the researches of these men: graham chitham, wishan, Robert and colleagues, roohollahi and colleagues jahanian, salehi and rezvanfar, saeed khadmi, araste and mahmoudi . [33]

2. In the second dimension case of faculty competency model that is skill:

Five parameter: perceptual, humanity, technical, problem solving , making goals is defined by fact oral analysis that with evaluating the history we realized that these parameters was brought in study of these men: sylviachung, akram abedian, jafary and colleagues khadiv Azde, gorji and siami. [34]

3. In the third dimensiaon case of faculty competency model that is ethical dimension:

Five parameters: faith and belif , islamci behavior, onus, reinforcement of islamic educational enuironment, justice are defined by fact oral analysis that with evaluating the history we realized that theses parameters was brought in the studies of these men: w.brad jonson, hedayat jafari moradi and doliskani , chitsaz, movahed and colleagues , torkman nezhad and colleague . [35]

4. In the forth dimension case of faculty competency model that is duty and role:

Five parameters: descriptive, information, communication, critic management and consultation are defined by fact oral analysis that with evaluation the history we realized that theseparameters 3was brought in the study of these men: Peter f, elivia, bright man and asefzade.

5. In the fifth dimension case of faculty competency model that is personnel sole:

Five parameters: producing stimulus, creativity and inventing brilliance, self- management and compatibility are defined by fact oral analysis that with evaluation the history we realized that, these parameters was brought in the study of these men:

Patric and smart , ramezan fatehi , jezni and colleague , ebrahim gharam and colleagues and hoseini and colleagues . [36]

Second question of the research

How much are the curent status of the parameters in the faculty of university?

In the evaluati8on of faculty competency at Fars state Islamic azad university units and evaluating the results of wilkaxon test we understood that all dimensions of faculty sufficiencies were suitable and apropiate but performance and the average [Table 4]. For grading the dimensions of competency and also groding the subparameters of competency dimensions we used freedman test that detected results as follows:

Table 4: Grading result of faculty competency dimensions

Faculty competency dimensions	Average grade
performance	1.38
Skill	3.95
Ethical	3.63
Duty	2.92
personal	2.65

In [Table 5] according to the above table the maximum priority belongs to skill dimension and the minimum priority belongs to performance dimension. (Annex paper)

Table 5: Grading results of subparameters of performance dimension

subparameter of performance dimension	Average grade
educational	3.02
Educational laddering	4.36
Educational organizing	4.04
consultation	5.09
Educational monitoring	5.09
researching	3.56

In [Table 6] according to the above table the maximum priority belongs to monitoring and the above table the minimum priority belongs to planning.

Table 6: The results of grading the skill dimension sub parameter

skill dimension sub parameter	Average grade
conceptual	3.08
human	2.85
technical	3.17
Problem solving	3.78
Goal makinmg	2.12

Maximum priority : problem solving sub parameter minimum priority: goal making sub parameter:
3. The result of grading the ethical dimension sub parameter: [Table 7]

Table 7: Ethical dimension sub parameter

skill dimension sub parameter	Average grade
Faith and belief	3.02
Islamic behaviour	2.86
responsibility	2.80
Islamic education environment reinforcement	2.77
justice	3.55

Maximum priority: faith and belief sub parameter
In [Table 7] minimum priority: justice sub parameter

Table 8: Grading resultys of duty dimension sub parameter

Duty dimension sub parameter	Average grade
Decision making	2.66
Critic management	2.97
communication	2.96
Data-information	3.88
consultation	2.52

Maximum priority: data and information sub parameter
In [Table 8] minimum priority: consultation sub parameter

Table 9: Grading results of personel subparameter

Personel sub parameter	Average grade
Stimulus	2.72
Creativity and inventing	2.89
Eliteness	2.96
Self- managing	3.88
compatibility	2.55

Maximum priority: self- managing sub parameter
In [Table 9] minimum priority: compatibility sub parameter

The third question of the study

What is the level of coordination degree of offered model from specialists view?

To answer to this study question, designed model associated with details, was given to eleven professors. Nine professors verified the model and the others believed that, the other effective dimensions exist and should be considered.

Thus, according to these offers and suggestion, 90% percent of specialists verified the above model and its validity.

And it is a suitable tool for evaluating the faculty sufficiencies.

CONCLUSION

Today mankind society development has close relationship with outputs of higher education. One of the big challenges that today higher education systems have, is quality and its promotion; improvement, guarantee. Every organization that can determine the quality and measure it and reach it, has gained a competition advantage and with this tool stabilizes that organization.

According to international quality test network in higher education, quality is: evaluating higher education with a standards (indexes detected before, b) duty, goals, respects.

For designing favorable higher education system in Iran, according to Iranian- Islamic civilization pattern they have tried to protect Islamic university values and ethics practically.

To achieve these goals with attention to Islamic Iranian background, universities move to sufficient system like views of Islamic system leader. Meritocracy requires some scientific and political consideration that can summarize them to five indexes; sufficient upbringing, sufficient detecting, sufficient choosing, sufficient wanting, sufficient protecting and the first step for having meritocracy system is to define sufficiencies.

In this study researcher has tried to evaluate the faculty sufficiencies in a different way and also he tried to draw and illustrate dimensions, parameters and indexes to prepare, improvement of quality and higher education progress.

According to the result from the study choosing and hiring sufficient faculty in the higher education system and specially in the Islamic azad university is so important and guarantee achieving and accessing to the organizations goals and targets. General model of competency evaluation can in the various parts of the country like government part quality increase and improvement and development of the organization.

Finding the updated indexes of faculty competency's evaluation are referring to updated models and using the results in the practical way, in fact, are the step toward above goals and targets according to the study, we offer to do these studies:

1. Evaluate and determine the competence of faculty of the other academic regions.
2. Evaluate and compare faculty competence in Iran with the other developed countries.
3. Preparing field, helps, financial helps and support in fundamental researches and practical studies related to competence development and the educational factors and items.
4. Evaluate the needs and requirement of education at regional needed competence.
5. Evaluate all (the other) effective parameters on competences development

CONFLICT OF INTEREST

There is no conflict of interest.

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REFERENCES

- | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>[1] Purohit Asefzade S. [2004] The most important ability of medic professors from faculty members viewpoint. 10th vernacular congress of education at medical sciences. Shiraz, medical sciences university of Shiraz. 12.</p> <p>[2] Araste H, Mahmoudirad M. [2003] effective education: an approach on the basis of teaching evaluation by students. Scientific journal of medical sciences university of Semnan, 5th book</p> | <p>[3] Araste H. [2005] how do the universities work? Higher education planning and research institute.</p> <p>[4] Abrahimi G, Soghra, colleagues [2009] creative teacher 10th vernacular education congress in medical sciences Shiraz, Shiraz medical sciences, university. 23.</p> <p>[5] Amin SJ, Shapour. [2003] Organization & management theory, Shiraz: kooshamehr publication.</p> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

- [6] Bazargan A. [2005] Steps of planning higher education development and its evaluation, management knowledge administrative and trading management university of Tehran. 9 (10):55-56.
- [7] Brightman H, Elliot B.[1993] Increasing the effectiveness of student evaluation of instructor data.decision sciences. 24(1):192-199.
- [8] Torkman NS. [1388] wise professor. 10th country congress of education in medical sciences shiraz , medical sciences university of shiraz.10.
- [9] Jebeli S. [2004] Effect of performance evaluation of persons of efficiency level promotion, master of science thesis Islamic azad university, Tehran sciences and researches
- [10] Jafari HC. [2013] Faculty members percept journal of mazadaran medical sciences university. 23(10).
- [11] Jafari M. [2009] scrutiny communication skills of faculty member in one of the 2nd brigade universities. 10th country congress of education in medical sciences, shiraz medical sciences university.18.
- [12] Jafari H. [2014] design and psychometric of evaluating tool for nursing faculty members vocational competency, doctorate thesis, irandoc.
- [13] Jahamian R. [2013] educational and researching performance evaluation of theran-central Islamic azad university faculty members.training Islamic azad university journal, bojnord unit. 33.
- [14] Johnson wb.[2003] a framework for conceptualizing competence to mentor. ethics & behavior ,13(2):127-151.
- [15] Chitsaz E. [2011] faculty members' competency pattern social planning and cultural studies office publication of ministry of technology and researches and science.
- [16] Hojjati , mohammad B. [1999] Islamic education and training mores , sadra publication
- [17] Hosseini, mohammad ali. [2009] favorable properties of a teacher, from university faculty members viewpoint. 10th country congress in medical sciences education, shiraz, shiraz medical science university.22.
- [18] kember A, jones C.[1996] A Global perspective on deeducational goals,teaching and evaluation .Rutledge publication
- [19] Khademi S. [2009] Comparing students and teachers viewpoint in the case of the most important properties of good teacher. 10th country congress in medical sciences education shiraz, shiraz medical sciences university.22
- [20] Khani JR. [2009] stronge teacher determination criterion. 10th country congress in medical sciences sciences education shiraz, shiraz medical sciences university.24.
- [21] Khadivar ZT. [2009] styles, habits and skills at work of stronge teachers, what are those? 10th country congress in medical sciences education shiraz, shiraz medical sciences university.24.
- [22] Roohollahi, ahmad ali C. [2014] effective fatdr detection over faculty members performance evaluation from students viewpoint police edvation management studies journal. 7(4).
- [23] Salehi S, jamshid GR. [2005] Managers competency evaluation with the 360 degree method industrial management studies journal. 9(73).
- [24] Sarmad Z, bazargan A, hejazi E. [1999] behavioral sciences behavioral sciences research method, Tehran, agah publication.
- [25] Fatehi R. [2013] Tehran and alborz jahad keshavarzi education centers teachers vocational sfficiencies evaluation master of science thesis.
- [26] Ferasatkah M. [2009] higher education and university, global views iran problems nei publication.
- [27] Govji, mohammad B, siami S. [2008] Islamic azad university faculty members performance criterion detection management quarterly. 5(11).
- [28] Graham C, Geoff C. [1996]towards a holistic model of professional competence. *Journal of European industrial training*. 20(5):20-30.
- [29] Mosaponr N. [2002] evaluation patterns theoretical fundamentals. Higher education planning and research quarterly number 23.
- [30] Movahed SU, saghebi R. [2009] scrutiny on vocational ethics principles from the wise doctor and the stronge professor, hohammad hossien agili shirazi viewpoints 10th counntrial education congress at medical sciences.shiraz , shiraz medical sciences university.18.
- [31] Moradi D, morteza. [2014] parameters olection and standards of Islamic education teachers teaching vocational ethics M.S thesis, irandoc.
- [32] Noorshahi N. [2008] place and grade of iran at education, research and innovatioin. Tehran, higher education planning and research institute.
- [33] sylvia C, horn MC.[2009] A values,skills and knowledge framework for initial teacher .*australian journal of teacher education*. 34(3)
- [34] Peter FO, Kenneth TH.[1980]what are the essential generic teaching competencies?theory into practice. 19(2):117
- [35] weshan HA.[1999] A study of effective teaching skills of preservice student teacher as perceived by cooperating teachers and university supervisors in Jordan.(doctoral dissertation).ohio university.
- [36] zachary A, smith.[2010] Higher education leadership competencies: quantitatively refining a qualitative model.journal of leadership & organizational studies. 17(1):61-70.

ARTICLE

RATING SUITABLE AREAS OF TOURISM IN IRAN, CASE STUDY: KERMAN PROVINCE

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ABSTRACT

Create and development of areas of tourism can be one of the dynamic factors and income-generating in the country. In Iran, the suitable area of tourism is said to a region to have attractions near the historical, cultural, religious, natural tourism in the country and are determined based on the capacity of four international, national, provincial and local levels. Investment for development of tourism can have an important influence on various aspects of tourism. More than 1000 prone areas of the country has been identified and the province of Kerman is one of the prone areas in tourism among 41 regional tourism. This study aimed to rating the areas of the province using TOPSIS Model, and 13 main indexes and selection of 20 regions of the prone province have received less attention by investors. Applied analytical-descriptive is used as research method. The population of this study consisted of experts and planning expert of tourism (150 experts) in areas related to tourism requires familiarity with sample areas. Volume of samples was determined using Cochran formula about 102 individuals. Finally, the ranking is done, The results show that investment in the areas of Keshit, Kerman, Bibi's Hayat, Gha'e Dokhtar castle, Vameqabad, Bondar Honza, has a high priority and investment in prone regions of Sandal, Sekonj, Tarz, Davaran and Ayub cave were relatively evaluating and investing in other regions has no economic justification and should be close to the ideal situation. Thus, in the present state, it is not logical to invest in these areas.

INTRODUCTION

Tourism is one of the largest economic drivers and is an economic tool in present century, so that followed by the industry composition and the concurrent use of internal and external resources, Social benefits, economic, cultural, environmental sources [1]. Tourism is important to the extent that World Tourism Organization has predicted in 2020 the number of tourists reached 1.5 billion people [2]. This has led many managers and planners of local, regional and national levels anywhere in the world plan and attempt for its development [3]. If we want the tourism industry in different geographic areas Improvement in the country should emphasize on the potential that the results cause more profits. Some geographic areas are diverse and unique potential as one of the most important aspects of these areas, Tourism is their ability [4]. The areas with environmental laws and regulations and maintain natural areas and environmentally are created based on a variety of issues and approved the tourism facilities and services. In Iran, the prone tourism region is said to a region that is created in the range of historical, cultural, religious and natural tourism attractions in the country and is determined based on the capacity of the four levels of international, national, provincial and local levels. Each area has service centers, welfare, culture, tourism, including accommodation units, reception, buy produce and handicrafts, cultural, artistic, recreational, Sports, parks and other tourism services [5].

Due to the area required for the construction of tourist facilities, including the accommodation and catering infrastructures needed in this geographic area are classified in terms of capacity and surface area of the areas of the four sections. These areas are classified according to the criteria, given the level of services and invest determined by the organization to determine the geographic and mapping the region by taking a set of factors that select the area as a tourism impact, basic and detailed studies are needed. The results of the study, the areas as an investment opportunity available to Domestic and foreign investors will be the regions are divided into four levels:

- A. sample of international tourism, an area which is designed and will be equipped to attract foreign tourists the minimum area of 300 hectares.
- (B) The areas of national, regional Iran aims to attract tourists from all over the country and is designed and equipped the minimum area of 100 hectares.
- C. areas of the province, an area that Tourism is designed and equipped to attract and the minimum area of 50 hectares.
- (D) The areas of local, regional with one or more of the city that is designed to attract tourists Is a minimum area of 30 hectares [6]. Which is based on the development of these areas can have a significant impact in various aspects of tourism in the country; and to achieve integrated management of Scientific studies are needed in this field is impressive.

Many of the world of Iran research and evaluation of tourism potential, which can be referred to:

KEY WORDS

political Tourism, Tourism areas, TOPSIS model, Kerman province.

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In a research entitled "potential tourism of Parmak Mountains" they found that in line with better use of the potential of mountainous areas, we can produce a tourism program that Balance based on "the principle of conservation-use" is. That in addition to protecting assets in the mountainous area, you can select a new approach that New options such as Geo-tourism and sustainable tourism, Cultural tourism, and tourism is to consider the nature [7].

In a research entitled "Performance Evaluation of Taiwanese tour". The survey questionnaire based on scale 9 option For 48 of the best tour to get ideas sent. 12 Criteria communication, interpretation, emergency, polite, friendly, clean, space, help, money, caution, vigilance and Honesty were classified in three aspects [8]. Combining models of ANP and TOPSIS In this study, assessment of Taiwanese tour performance was achieved. Consider the region as a whole [9].

[10] A study on the identification of potential tourist of The Republic of Macedonia to the conclusion that potential in the tourism sector on the set of policies, prepare action plans and competitive tourism sector In the context of sustainable development. In this research, the tourism sector in a variety of capacities and is known as one of the inhomogeneous potential, it is necessary in the preparation of measures and it is considering the development of tourism facilities [11].

[6] prioritize capacity rural tourism city that would be paid the results show, villages (Saqqezchi, Shiran, Viyand-e-kalkhoran, Borjlou, Golestan, Gugarchin) are higher priority.

[12] to analyze the degree of development cities of East Azarbaijan province by using AHP and TOPSIS technique are discussed. The study showed that the city of Tabriz Since the administrative center of the province's political In terms of health indicators in the first place and Malekan city at this level than any other cities is in last place.

[13] in their research and evaluation stratification attractions, historical and cultural city of Neyshabur have, also for the level tourist attraction Multi-criteria decision-making techniques have been used. Final results of the study show that the attractions of the city there are three levels of priority.

[5] studied the effect of tourism in the region deprivation Uramanat using participatory appraisal methods and capabilities, Uraman regional capabilities in the areas of employment and consequently paid deprivation, the components of Expected in 7 groups and 71 subgroups on The tourist attractions in the region Uraman deprivation Based on the average importance score, the components, capacity building in the region and average total.

The Kerman province has 41 regional tourism is the ninth in the number of areas. The province has a diverse climate, beautiful mountains, rivers full of water, beautiful mirage, a variety of vegetation, rare ecosystems, ranging from ancient monuments different periods and different traditions, always eager tourists from home and abroad to attract. Given the importance of tourism and tourist attraction areas in the country and given that one of its goals is to develop tourism and study Stimulate the development in the areas of tourism In this study, we try to prioritize the areas of Kerman Decision-making and selection of the top priorities when the principle that Based on the scientific method is adopted. Considering the set of indicators and the use of multi-criteria decision in this regard you can optimize the use of resources and Tourism facilities necessary to attract tourists.

MATERIALS AND METHODS

To achieve the goal of this research study ranking areas of Kerman province, TOPSIS technique is a multi-criteria decision-making techniques. It uses one of the methods for selecting model Select a top destination for tourism. The sample size of specialists and Tourism is planning experts 20 region of the areas of the province have the necessary understanding, which is equal to 102 using the Cochran formula specified. With respect to each of the stages of investigation achieve the research objectives, Sample questionnaire was designed and the survey was presented to the experts. The questionnaire was used to rank the 13 indicators. The results of the evaluation and ranking of the samples were obtained.

RESULTS

Study area: Kerman in southeastern plateau between 54° 21' to 59° 34' east longitude and 26°, 29' north latitude 31° 58'. The area is 183,285 square kilometers, and more than 11.5% of the country's area is allocated. From North to South Khorasan province of Kerman and Yazd, South of the province, and the province of East and West of the province of Kerman. The province limited until the end of 2010 has 23 city, 58 districts, 64 cities and 151 villages (Statistical Yearbook of Kerman, 2011). [Fig. 1] shows the location of the Kerman province of Iran.[Fig. 2] shows the distribution areas of the province.

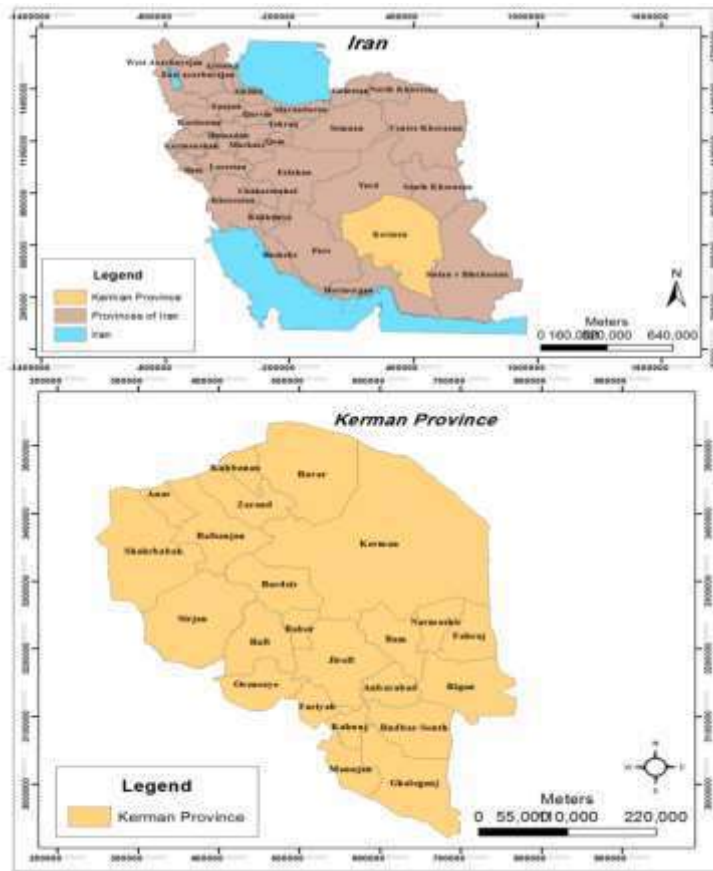
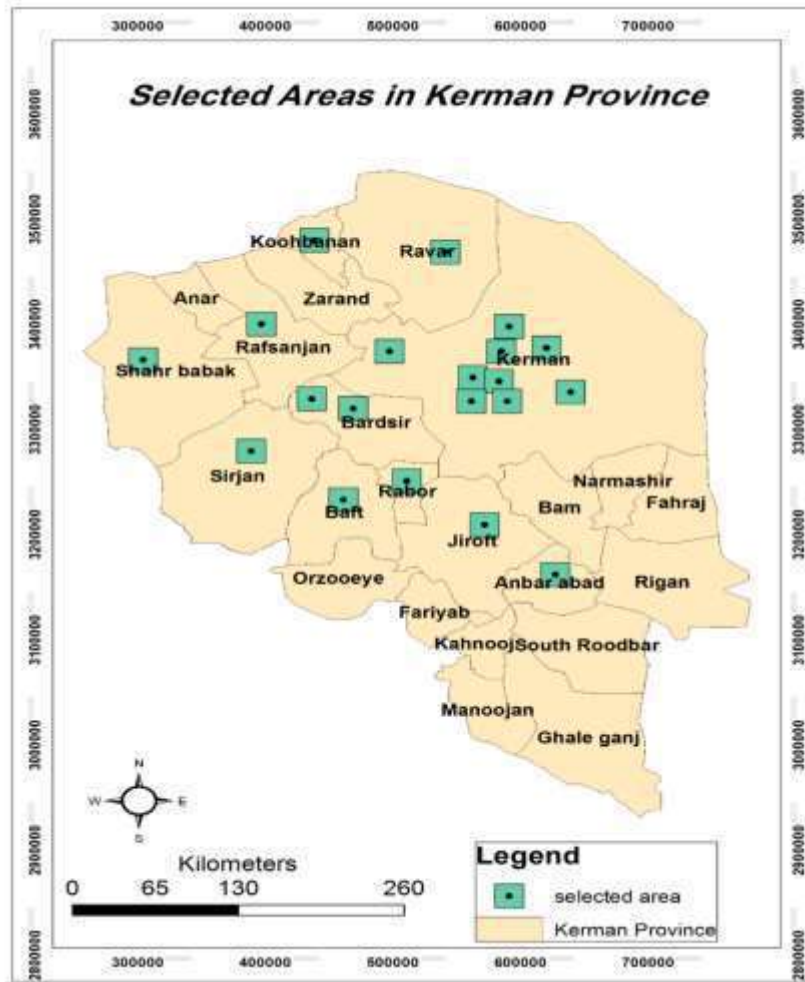


Fig.1: Location of Kerman province.

A total of 20 regional tourism less attention Investors in the tourism sector have been of the 41 districts in the province have been selected by the author.

In [Table 1], the characteristics of these regions are presented. Rankings were used based on the 20 regions and 13 indexes are shown in [Table 2].



Source: author

Fig. 2: Distribution of sample areas of tourism in Kerman province.

Table 1: Selected characteristics of the 20 regional tourism

Row	Region Name	Geographical Location	Ownership Area	Existing infrastructure	Distance to city center	Available variety of attractions	Field of investment
1	Ghal'e Dokhtar castle	Kerman	Housing and urban development	Water, roads, electricity, telephone, gas	-	Despite the rocky landscape of fountains, the surrounding mountains	Residential, recreational, cultural, commercial
2	Keshit,	Kerman city Golbaf district	Natural resources	Water, roads, electricity, telephone	140km	Existence of historic castles and cultural landscapes	Residential, recreational, cultural, commercial
3	Kenar Sandal	Anbarabad city	Natural resources	Water, roads, electricity, telephone	10km	Existence of agricultural production and the nature of the four seasons	Residential, recreational, cultural, commercial
4	Bondar Honza,	Rabar city	Natural resources	Water, roads, electricity, telephone	29km	Existence of natural areas and handicrafts	Residential, recreational, cultural, commercial

5	Bagh-e-Sangi, and Ghal'e Sang	Sirjan city	Natural resources	Water, roads, electricity, telephone	21km	Nearly free zone	Residential, recreational, cultural, commercial
6	Sirch	Kerman city, Shahdad district	Natural resources and proof of ownership	Water, roads, electricity, telephone	60km	Existence of shrines and old castles	Residential, recreational, cultural, commercial
7	Ayub cave	Shahr Babak city	Natural resources	Water, roads, electricity	72km	Existence of Ayub cave and Wildlife	Residential, recreational, cultural, commercial
8	Gughar rural district	Baft city	Natural resources	Water, roads, electricity, telephone	44km	Existence of rural landscape and Fusilli's Hill	Residential, recreational, cultural, commercial
9	Lalezar	Bardsir city	Natural resources	Water, roads, electricity, telephone	75km	Existence of spa and medicinal plants	Residential, recreational, cultural, commercial
10	Sarvestan	Kerman city	Personal	roads, electricity	19km	Mountain scenery and natural beauty	Residential, recreational, cultural, commercial, and 5 stars hotels
11	Tarz	Raver city	General governmental and private	Water, roads, electricity, telephone	38km	Historical and natural attractions	Residential, recreational, cultural, tourism
12	Tooba	Kerman city	Personal	Water, roads, electricity, telephone	15km	Mountain scenery and natural beauty	Residential, recreational, cultural, commercial, and 3star hotels
13	Zibatapeh	Kerman city	Personal	Water, roads, electricity, telephone	55km	Taking over the communication Kerman, Bam and water resources and beautiful hills	Residential, recreational, cultural, commercial
14	Water Mills	Kuhbanan city	Governmental, personal	Water, roads, electricity, telephone	1km	Kuhbanan and historical attractions Existence of close to town and 2 spa	Residential, recreational, cultural, commercial, Tourism and hydrotherapy centre
15	Bibi Hayat	Central part of Kerman city	personal, consecrated	Water, roads, electricity, telephone	85km	Existence of shrine	Residential, recreational, cultural, commercial
16	Bidkhan	Bardsir city	Natural resources, personal	Water, roads, electricity, telephone	36km	Natural attractions, forests, rivers, mountains	Residential, recreational, cultural, tourism
17	Davaran	Rafsanjan city	Natural resources, personal, consecrated	Water, roads, electricity, telephone	27km	Unique natural attractions and pleasant weather and shrine	Residential, recreational, cultural, pilgrimage
18	Sardoeie	Jiroft city	Natural resources	Water, roads, electricity, telephone	90km	Pleasant weather, waterfalls, natural attractions	Residential, recreational, cultural, pilgrimage
19	Sekonj	Central part of Kerman city	Natural resources, personal,	Water, roads, electricity, telephone	50km	Pleasant weather, waterfalls,	Residential, recreational, cultural,

			consecrated			natural attractions and the tomb of Sheikh Ali Baba	pilgrimage
20	Vameqabad	Kerman city	Natural resources, personal, consecrated	Water, roads, electricity, telephone	32km	Pleasant weather, natural beauty and proximity to the city of Kerman	Residential, recreational, tourism and construction ropeway

Source: Organization of Cultural Heritage, Tourism and Handicrafts, Kerman, 2010.

Row	Index	Factors
1	Located on a feature or Tourist attraction features And harmony with the surrounding area attractions	Historical attractions: Tomb of the old fort, historic and special place ... And natural phenomena: mountains, forests, springs, beaches and.... Cultural attractions, historical sites, art exhibits, original habitat, museums and more.
2	Absorption of specific regional climate (climate suitable for tourism)	Thermal effects: temperature, humidity, wind and ... Physical effects: Walnut annoying dust, rain and continuous ... Aesthetic effect: the optimal sun exposure, beautiful clouds, a good amount of sunshine and....
3	visual status of areas, and attractiveness of	Landscape, number and type of area attractions.
4	Enough space tourism target area	Sufficient land for investment and development areas
5	availability status of facilities and services	Access and quality of roads, the distance to the center of the province or city, the distance to the nearest town Facilities, health care, accommodation, mail, freight and ...
6	The availability of infrastructure or Practical areas of infrastructure development	Drinking water, electricity, telephone, gas, roads....
7	Scarcity	Number of similar places in the area and the uniqueness
8	Number of visitors per year	Capabilities On place to attract visitors
9	Community awareness of the beauty of the place	Intended to inform the public of the location of different ways: brochures, press, advertising sites, etc.
10	Environmental impact	Lack of water pollution, air and noise, ecological problems, damage to archaeological sites, environmental risks and problems of land use
11	Economic Impact	Income level, direct employment, indirect employment
12	Quality indicators Security	Security, economic, social, political, and cultural life....
13	Investment incentives	Parameters that are desired On place to attract investors to build infrastructure and investment barriers

DISCUSSION AND CONCLUSION

Ranking in selected areas of TOPSIS method is conducted in the Kerman province. This method in 1981 by Huang and Yon were presented. The method or the m option by an individual or group of individuals Decision- making evaluated. This technique is based on the concept that each choice factor of the minimum distance The ideal factor positive (most important) and The distance to the negative ideal (Least important factor) is In other words, this method With an ideal distance of the positive and Negative measured and this criterion classification and prioritization factors [12]. These steps include:

Step One: Create a matrix of decision:

At this stage, the matrix will be drawn on line options (sample areas of tourism) and on the last column of the row indices and weights each indicator is given, and on intersection of rows and columns, the importance of each respondent for each of the options With respect to the index is brought [Table 3] Decision Matrix N).

Table 3: Decision Matrix N

Indices				
	C ₁	C ₂	...	C _n
Options				
A ₁	r ₁₁	r ₁₂	...	r _{1n}
A ₂	r ₂₁	r ₂₂	...	r _{2n}
⋮	⋮	⋮		⋮
A _m	r _{m1}	r _{m2}	...	r _{mn}

W_j	W_1	W_2	...	W_n
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Source: Author

Point's option is the index of the jth and ith index is weighted. **Table 4** shows a matrix of decision research. The matrix arithmetic average of the opinions of all professionals and experts. A matrix values on the areas of tourism and C values are indicators of the study.

Table 4: Decision matrix N in research

	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13
Index type	Positive	Positive	Positive	Positive	Positive	Positive	Positive	Positive	Positive	Positive	Positive	Positive	Positive
A1	4.71	1	4.78	4.71	4.14	4.14	4.42	4.14	1.78	3.14	4.14	2.42	3.42
A2	4.78	2.14	4.14	4.42	4.35	4.14	4.42	4.42	3.14	3.42	3.35	3.42	3.42
A3	4.14	1	4.14	4.42	3.42	3.14	1.78	3.14	3.42	3.14	2.42	3.14	2.42
A4	3.14	2.14	4.35	4.35	4.14	4.42	1.42	2.42	2.14	3.07	2.42	2.42	4.42
A5	4.143	1	1	1	4.429	1.786	1.357	3.429	1	3.429	2.143	1	4.429
A6	4.429	1	1.071	1	4.143	3.143	1.429	3.429	1	4.357	1.357	1.429	4.357
A7	4.143	2.143	2.143	1.357	4.429	3.429	1.357	3.143	1.357	3.429	1.357	2.143	3.429
A8	4.429	1.357	1.357	1.357	3.429	4.214	1.357	2.143	1	3.429	1	2.214	4.286
A9	4.143	1.357	1	1.357	4.429	1.786	1	2.357	1	4.143	2	2	4.143
A10	3.143	1.357	1.357	1	3.786	2.786	1	2	1	3.143	1.357	1	4.214
A11	4.429	1.429	1.357	1.429	4.429	3.357	3.429	2.429	2.357	4.143	1.786	1.714	3.429
A12	4.143	1	1	1.357	4.786	2.143	1.786	2.143	1.786	3.143	1.786	1.357	4.143
A13	4.429	1	1.357	1	4.429	2.786	1.786	1.5	1.786	2.786	1	1	3.786
A14	4.786	1	1.071	1	3.786	2.143	1	2	1.357	3.214	1	1.643	3.857
A15	3.786	4.429	4.786	4.429	3.786	2.786	2.357	3.786	1.786	3.786	2.786	1	4.429
A16	4.214	1	1.429	1	2.786	3.143	1.786	3.071	2.143	3.786	1.714	2	3.429
A17	3.786	1	1	1	3.143	2	2.786	1.643	3.786	2	1	2	4.143
A18	3.143	1	1	1	4.143	3.929	1.857	1.643	2	3.786	2.357	2	3.429
A19	3	1	4.429	4.786	3.429	3.786	2	3.429	2	3.786	2.5	2	3.429
A20	4.429	2	4.429	4.714	3.786	3.429	2	3.786	2	3.786	3.786	2.571	3.857
Weight	0.077	0.077	0.077	0.077	0.077	0.077	0.077	0.077	0.077	0.077	0.077	0.077	0.077

Source: Author

Second step: The normalized decision matrix (normalizing):

To be comparable values, decision matrix converted using Equation 1, the normal matrix or matrix scale (

 N_1),

$$n_{ij} = \frac{r_{ij}}{\sqrt{\sum_{i=1}^m r_{ij}^2}}$$

(1)

[Table 5]shows the matrix scale:

Table 5: Scale Matrix N1

	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13
A1	0.257	0.134	0.379	0.37	0.232	0.287	0.44	0.316	0.195	0.202	0.411	0.266	0.199

A2	0.261	0.286	0.328	0.347	0.244	0.287	0.44	0.338	0.343	0.22	0.333	0.376	0.199
A3	0.226	0.134	0.328	0.347	0.192	0.218	0.178	0.24	0.374	0.202	0.241	0.345	0.141
A4	0.171	0.286	0.345	0.342	0.232	0.307	0.142	0.185	0.234	0.197	0.241	0.266	0.257
A5	0.226	0.134	0.079	0.078	0.248	0.124	0.135	0.261	0.109	0.22	0.213	0.11	0.257
A6	0.241	0.134	0.085	0.078	0.232	0.218	0.142	0.261	0.109	0.279	0.135	0.157	0.253
A7	0.226	0.286	0.17	0.106	0.248	0.237	0.135	0.24	0.148	0.22	0.135	0.235	0.199
A8	0.241	0.181	0.107	0.106	0.192	0.292	0.135	0.163	0.109	0.22	0.099	0.243	0.248
A9	0.226	0.181	0.079	0.106	0.248	0.124	0.099	0.18	0.109	0.266	0.198	0.219	0.24
A10	0.171	0.181	0.107	0.078	0.212	0.193	0.099	0.152	0.109	0.202	0.135	0.11	0.244
A11	0.241	0.191	0.107	0.112	0.248	0.232	0.341	0.185	0.257	0.266	0.177	0.188	0.199
A12	0.226	0.134	0.079	0.106	0.268	0.148	0.178	0.163	0.195	0.202	0.177	0.149	0.24
A13	0.241	0.134	0.107	0.078	0.248	0.193	0.178	0.114	0.195	0.179	0.099	0.11	0.219
A14	0.261	0.134	0.085	0.078	0.212	0.148	0.099	0.152	0.148	0.206	0.099	0.18	0.224
A15	0.206	0.592	0.379	0.347	0.212	0.193	0.234	0.289	0.195	0.243	0.276	0.11	0.257
A16	0.23	0.134	0.113	0.078	0.156	0.218	0.178	0.234	0.234	0.243	0.17	0.219	0.199
A17	0.206	0.134	0.079	0.078	0.176	0.138	0.277	0.125	0.413	0.128	0.099	0.219	0.24
A18	0.171	0.134	0.079	0.078	0.232	0.272	0.185	0.125	0.218	0.243	0.234	0.219	0.199
A19	0.163	0.134	0.351	0.375	0.192	0.262	0.199	0.261	0.218	0.243	0.248	0.219	0.199
A20	0.241	0.267	0.351	0.37	0.212	0.237	0.199	0.289	0.218	0.243	0.376	0.282	0.224

Source: Author

Third step: To obtain a weighted matrix scale:To obtain the scale of weighted matrix (V), the scale of the matrix (obtained from the second step)multiply in asquarematrix ($w_{n \times n}$) the main diagonal elements of the weights of indicators and other elements are zero.

$$V = N_1 \times w_{n \times n} \quad (2)$$

[Table 6] Shows the matrix scale weighty.

Table 6: Scale weighty matrix V

	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13
A1	0.02	0.01	0.029	0.028	0.018	0.022	0.034	0.024	0.015	0.016	0.032	0.021	0.015
A2	0.02	0.022	0.025	0.027	0.019	0.022	0.034	0.026	0.026	0.017	0.026	0.029	0.015
A3	0.017	0.01	0.025	0.027	0.015	0.017	0.014	0.018	0.029	0.016	0.019	0.027	0.011
A4	0.013	0.022	0.027	0.026	0.018	0.024	0.011	0.014	0.018	0.015	0.019	0.021	0.02
A5	0.017	0.01	0.006	0.006	0.019	0.01	0.01	0.02	0.008	0.017	0.016	0.008	0.02
A6	0.019	0.01	0.007	0.006	0.018	0.017	0.011	0.02	0.008	0.022	0.01	0.012	0.019
A7	0.017	0.022	0.013	0.008	0.019	0.018	0.01	0.018	0.011	0.017	0.01	0.018	0.015
A8	0.019	0.014	0.008	0.008	0.015	0.022	0.01	0.013	0.008	0.017	0.008	0.019	0.019
A9	0.017	0.014	0.006	0.008	0.019	0.01	0.008	0.014	0.008	0.02	0.015	0.017	0.018
A10	0.013	0.014	0.008	0.006	0.016	0.015	0.008	0.012	0.008	0.016	0.01	0.008	0.019
A11	0.019	0.015	0.008	0.009	0.019	0.018	0.026	0.014	0.02	0.02	0.014	0.014	0.015
A12	0.017	0.01	0.006	0.008	0.021	0.011	0.014	0.013	0.015	0.016	0.014	0.011	0.018
A13	0.019	0.01	0.008	0.006	0.019	0.015	0.014	0.009	0.015	0.014	0.008	0.008	0.017
A14	0.02	0.01	0.007	0.006	0.016	0.011	0.008	0.012	0.011	0.016	0.008	0.014	0.017
A15	0.016	0.046	0.029	0.027	0.016	0.015	0.018	0.022	0.015	0.019	0.021	0.008	0.02
A16	0.018	0.01	0.009	0.006	0.012	0.017	0.014	0.018	0.018	0.019	0.013	0.017	0.015

A17	0.016	0.01	0.006	0.006	0.014	0.011	0.021	0.01	0.032	0.01	0.008	0.017	0.018
A18	0.013	0.01	0.006	0.006	0.018	0.021	0.014	0.01	0.017	0.019	0.018	0.017	0.015
A19	0.013	0.01	0.027	0.029	0.015	0.02	0.015	0.02	0.017	0.019	0.019	0.017	0.015
A20	0.019	0.021	0.027	0.028	0.016	0.018	0.015	0.022	0.017	0.019	0.029	0.022	0.017

Source: Author

Step Four: Determine the ideal of positive and negative ideal:

On this stage should be set by the respondents as the most important and most minor factors have been identified. In other words, the index is positive, the positive ideal and negative ideal value of v is the smallest value of v , as well as for negative indices, ideal for the smallest positive value of v and v is the biggest negative ideal. Equation 3 and 4 states.

$$A^+ = \left\{ \left(\max_i V_{ij} \mid j \in J \right), \left(\min_i V_{ij} \mid j \in J' \right) \mid i = 1, 2, \dots, m \right\} = \{V_1^+, V_2^+, \dots, V_n^+\}$$

Positive ideal:
(3)

$$A^- = \left\{ \left(\min_i V_{ij} \mid j \in J \right), \left(\max_i V_{ij} \mid j \in J' \right) \mid i = 1, 2, \dots, m \right\} = \{V_1^-, V_2^-, \dots, V_n^-\}$$

Negative ideal:
(4)

On this relationship, the indicators are positive and negative indicators. **Table 7** shows the positive and negative ideal.

Table 7: Positive and negative ideals for each index

Criterion	Positive ideal	Negative ideal
C1	0.02	0.013
C2	0.046	0.01
C3	0.029	0.006
C4	0.029	0.006
C5	0.021	0.012
C6	0.024	0.01
C7	0.034	0.008
C8	0.026	0.009
C9	0.032	0.008
C10	0.022	0.01
C11	0.032	0.008
C12	0.029	0.008
C13	0.02	0.011

Source: Author

Fifth step: Calculate the distance from the ideal positive and negative:

At this stage, the distance between each of the options Positive and negative ideal of perfect 5 and 6 will be determined according to the relationship.

$$d_i^+ = \sqrt{\sum_{j=1}^n (V_{ij} - V_j^+)^2} ; i = 1, 2, \dots, m$$

ith distance from a positive ideal option:

$$d_i^- = \sqrt{\sum_{j=1}^n (V_{ij} - V_j^-)^2} ; i = 1, 2, \dots, m$$

ith distance from a negative ideal option:

Distance each of the positive and negative ideal options is located on the **table 8**.

Sixth step: Calculate the vicinity of each of the ideal of positive and negative ideal:

The proximity of each option is ideal for both positive and negative ideal (CL_i) is obtained according to equation 7.

$$CL_i = \frac{d_i^-}{d_i^- + d_i^+} \quad (7)$$

Table 8 shows the values for each option.

Step Seven: Ranking options:

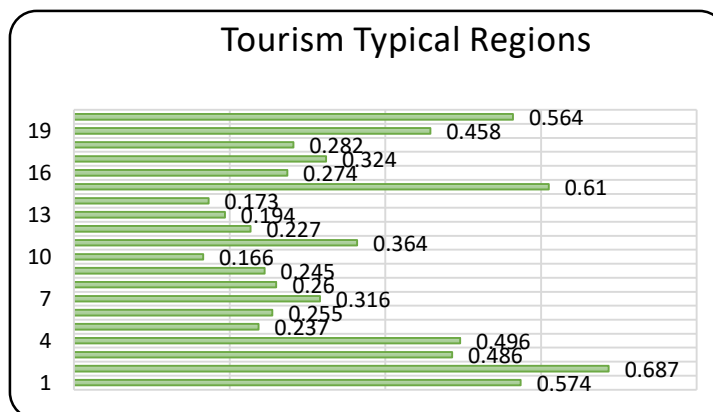
The options are based on the ranking, i.e. any option that will gain a higher ranking. [Table 8] , ranking options (Sample areas of tourism Kerman province).

Table 8: Ranking options (sample areas of tourism the province)

Row	Options	Distance to Positive ideal	Distance to Negative ideal	CL_i	Rank
1	A1	0.041	0.055	0.574	3
2	A2	0.026	0.058	0.687	1
3	A3	0.046	0.044	0.486	6
4	A4	0.042	0.041	0.496	5
5	A5	0.066	0.02	0.237	16
6	A6	0.065	0.022	0.255	14
7	A7	0.054	0.025	0.316	10
8	A8	0.062	0.022	0.26	13
9	A9	0.063	0.02	0.245	15
10	A10	0.067	0.013	0.166	20
11	A11	0.052	0.03	0.364	8
12	A12	0.062	0.018	0.227	17
13	A13	0.066	0.016	0.194	18
14	A14	0.068	0.014	0.173	19
15	A15	0.035	0.054	0.61	2
16	A16	0.059	0.022	0.274	12
17	A17	0.062	0.03	0.324	9
18	A18	0.06	0.024	0.282	11
19	A19	0.048	0.04	0.458	7
20	A20	0.037	0.047	0.564	4

Source: Author

The results of the ranking of the alternatives using TOPSIS technique Suggests that Keshit, Kerman region of giving preference to other options or the area is tourism. [Fig. 3] shows the ranking of sample areas of tourism investment for the show.



Source: author

Fig. 3: Ranking sample areas of tourism in Kerman province.

According to the findings of the study, Investments in sample areas of tourism Keshit, Bibi's Hayat, Gale Dokhtar castle, Vameqabad, Bondar Honza, are on top priority is a flourishing port and investment in regions with Sandals, Sekonj, Tarz, Davaran, and Ayub cave Intermediate and investment in other areas of economic justification not much closer to the ideal situation. Thus, in the present state investment in these areas is not logical.

CONCLUSION

According to the findings It can be concluded that, firstly, Diverse tourism potential There is a study area, Secondly, it is a good plan In the areas of development If funds are limited and Directed towards the attractiveness of the More positive results for Both tourists and local residents Bring. To facilities and infrastructure the supply area attractions and more for tourists, especially the younger generation and Funded education. Also using Statistical analysis was performed and ratings TOPSIS model in [Table 8] and [Fig. 1] It has been shown, it can be concluded that Investments in the areas of Keshit, Bibi's Hayat, Gale Dokhtar castle, Vameqabad, Bondar Honza, are in a high priority and investment in regions with Sandals, Sekonj, Tarz, Davaran and Ayub cave average assessed and investment in other areas of economic justification not much closer to the ideal situation. Thus, in the present state investment in these areas, it is not logical.

The recommendations with respect to the objectives of the study can be represented as follows:

- The province with 41 regional tourism component 9 Superior in terms of the areas of the Tourist attractions that the capacity should be appropriate investments made on these areas. Half of these regions in terms of development in the poor and therefore these areas are coordinated and with more effort placed on the development of regional tourism.
- Review the investment and distribution facilities, Services and tourist facilities in the area, and prioritize the allocation of these types of facilities in the areas of medium and high functionality. Areas which are backward in terms of infrastructure also see the need to invest more.
- Build and repair roads and areas Tourist spots and also equip these places Signs for easy access to tourist attractions, natural, historical, and
- Provide adequate equipment for camping mountain Welfare tourists to the areas of the Geo-tourism capabilities and mountain sports travel.
- Inform and introduce a more specific area attractions.
- Celebrations, festivals and Local Conferences Cultural and natural attractions of the area are presented and Tourists are attracted to the name of the region.
- Establish residence and reception centers in accordance with the wishes and Lifestyle and consumption behavior of people and tourists planning for the preparation of rural houses for the reception of tourists.

CONFLICT OF INTEREST

Authors declare no conflict of interest.

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REFERENCES

- [1] Doswill R. [2005] Tourism Management (Fundamentals, Strategies and Impacts)", Translated by Arabi, SM, Izadi D. Cultural Research Bureau, Third Edition. (In Persian).
- [2] Ziyari YA, Khodadadi R. [2009] The development and its role in creating jobs in Semnan", Proceedings of the National Conference on tourism, sustainable development and job creation.
- [3] Bidokhti Amin, Ali Akbar, Zargar, Seyed Mojtaba and Nazari Mashalh. [2010] A strategic marketing mix in the tourism industry", Management of Strategic Studies, No. 3, Tehran.
- [4] Abdullahi, Alamdar, [2009] The conversion function Shiraz old tourist attractions, past, now, next", M.A Thesis, Geography and Urban Planning, University of Sistan and Baluchestan.
- [5] Tavakoli, M, Kiani, A, Hedayati S. [2010] Impact in the areas of deprivation of Views of local communities (Case Study: Flat Uraman region of Kurdistan)", Urban and regional studies and resear Eftekhari A, Portahri M, Mahdavian F. [2011] Prioritize tourism capacity Nir rural city", Geography and Development, 24:34-23.
- [6] rch in the second year, No. VI, fall 2010 pp94-73.
- [7] Bülent Deniza, Çi. demKiliçasłana, Bari. Karaa, Tendü Hilal Gökta.a, Erdinç Kutsalb. [2011] Evaluation of the tourism potential of Parmak Mountains in the respect of protection – use balance", Procedia Social and Behavioral Sciences 19:250–257.

- [8] Liao S-K, Chen Y-C, Chang K-L, Tseng T-W. [2011] Assessing the performance of Taiwanese tour guides", *African Journal of Business Management*, 5(4): 1325- 1333.
- [9] Taghizadeh Z, [2012] Ranking the areas of Iran - a case study: Kermanshah Province", M.Sc Thesis, Environmental Planning Department of Geography, University of Sistan and Baluchestan.
- [10] Ivana Nestorovska (2012) Identifying tourism potentials in republic of Macedonia through regional approach", *Procedia - Social and Behavioral Sciences* 44:95 – 103.
- [11] Afghanizadeh, M, 2012, "The ranking of Case Study Delfard tourism and Dehbakri", M.A Thesis, Department of Geography and Tourism Planning, Islamic Azad University, Zahedan.
- [12] Zangiabadi, Ali, Jaber Alizadeh and Mehdi Ahmadian, 2011, "Analysis of the degree of development of the city of East Azarbaijan Techniques using TOPSIS and AHP", *new attitude Journal In human geography*, Issue 30.
- [13] Ziaei Mahmoud, Daghestani D, [2010] Analytical Hierarchy historical attractions - the cultural city of Neishabur, *Journal of Geography and Development*, No. 17.
- [14] Cultural Heritage organization, Tourism and Handicrafts, Kerman city, 2010, Opportunities tourism investment in Kerman province".
- [15] Kerman Statistical Yearbook. [2011] Statistical Center of Iran.

ARTICLE

STUDY OF ENVIRONMENTAL FACTORS OF OLYMPIC GAMES ON THE HOST CITIES FROM PROFESSORS AND EXPERTS VIEWPOINT CASE STUDY: LONDON 2012 OLYMPIC

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ABSTRACT

The Olympic Games are a world renowned sports Competition. The purpose of this research is Study of environmental factors of Olympic Games on the host cities from professors and expert's viewpoint, which was conducted as a case study on London 2012 Olympic. The method of this research was qualitative and quantitative. In the first phase, a questionnaire was developed using interviews with 25 individuals from professors and experts in physical education, sport management, economics and achieve theoretical saturation, as well as the history of literature. Then Content validity of the questionnaire was approved by professors, and its reliability was calculated using Cronbach's alpha for environmental factors 0/84. Secondly, according to a list of experts and professors in the field who have written and researched article, was sent questionnaire for them, which in ultimately were collected, necessary information than 120 people from the professoriate and Experts inside Country and outside Country. Thus the sampling was non-random targeted sampling methods and accessible. The descriptive statistics were used to calculate central tendency and dispersion, and inferential statistics were used to determine the KS test for normal data; Friedman test was done for ratings and ANOVA to compare the views of the software SPSS16 ($P < 0.05$). Friedman test related to respondents Overall view showed that, Transport Promotion is the highest rating, and biodiversity development is the lowest rating. According to the results of the ANOVA are considered among the masters and experts, and professors and experts from abroad in environmental factors, there is no significant difference at $P < 0.05$.

INTRODUCTION

Encyclopedia Britannica (2008b) suggest that the founder of the Olympic Games (Baron Pierre de Coubertin), with the goal of peace and equality, founded it with the slogan stronger, higher, faster. IOC is responsible for choosing the host city for the Olympics. The host city is responsible for the regulation and investment (funding) celebration of the Games consistent with the Olympic Charter; these programs include competitions, which are determined by the IOC [1].

Pierre de Fredy, the Baron de Coubertin, founded the modern Olympic Games after inviting delegates to come to Paris to discuss amateur sports at an international athletic congress. Coubertin then surprised them with a proposal to revive the Olympic Games of classical times and the 78 delegates from 9 countries voted unanimously to support his dream. Coubertin believed that the Olympics was much more than just a sporting event, and developed a philosophy to underpin the Olympic movement and guide its development. The Olympic charter⁴ devised by Coubertin states that Olympism is a philosophy "exalting and combining in a balanced whole the qualities of body, will and mind," Blending sport with culture and education, it seeks to create a way of life based on the "joy found in effort, the educational value of good example and respect for universal fundamental ethical principles"[2].

National Olympic Committees, almost 10 years before holding the Olympics period, send a notice to all National Olympic Committees. Eight years and a half before the game, cities have volunteered to host the Games, they have announced their bids. IOC has approximately seven years before the Games; will select the host city. Candidate cities must begin to organize the games, with a detailed plan, including equipment and sport facilities and accommodation capacity, public and private transportation and communication and..... [3]. The Olympic Games like World Fairs have become major showcases for the host cities and countries. The Games have evolved to have considerable impacts on the host cities. From an economic perspective, the Games have a catalyst effect for the economic development. These Games have changed the infrastructure and environment of the host city. For example, the Rome Games of 1960 improved the public transportation and built a new water supply system for the city. The Tokyo Games of 1964 built 22 new highways and improved the city's water and sewage system [4].

In 1999 the Sport and Environment Commission implemented its own Agenda 21 according to the 1992 Rio Agenda 21. The Olympic Movement's Agenda 21 focuses on three main points:

1. Improving socio-economic condition;

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2. Conservation and management of resources for sustainable development;
3. Strengthening the role of the main groups. (IOC, 2003)

The Games of London 1908 was the first Games to build a new venue. However, the new White City Stadium was not a success due to the accommodation of too many sports[5].

In 1994 the IOC working together with UNEP adopted the sustainable development concept for the Olympic Games. The Olympic Games in Lillehammer 1994 were the first green Games. The outcome of those Games made IOC more clearly on the importance of the environment. In 1995 the Sports and Environment Commission was created, and environment become the third pillar of the Olympic charter together with sport and culture [4].

Environmental activities of the olympic movement

1972: Japan's Sapporo Winter Games, Contests condition was confirmed, after finishing the game, the environment can be restored to original condition, and does not harm the surrounding environment.

1972: Munich Olympic Games, was designed buildings, with the precondition that the collection after the game has been used as a natural park for residents of Munich.

1992: During the Olympic Games in Barcelona, the IOC's athletes and officials, along with other members of this movement have attempted to sign a treaty entitled "Convention on Earth", by which they bound themselves to protect and protection of the earth.

1993: This year, the City of Sydney, with a commitment to the pursuit and development of environmental guidelines, was chosen to host the Olympic Games in 2000.

1994: City L. Hummer, with considerable emphasis on environmental responsibilities, began the Winter Olympics.

1996: The International Olympic Committee took action, the Commission Sports and Environment. The environment was introduced as the third pillar of the Olympic Charter.

1997: The Second World Conference on Sport and Environment held in Kuwait.

1999: Third World Conference on Sport and Environment held in Rio de Janeiro, Brazil, and adopted Agenda 21 Olympic Movement.

2000: Olympic Games in Sydney, behind the new international standards, in order to integrate environmental issues with decision making, construction and operation of various sports events.

The Winter Games in Nagano, Japan, for the construction of buildings and needed sports facilities, thousands of trees were cut. In contrast, tens of thousands of trees have been planted by athletes and students from ten years ago, around the set. At the Nagano Winter Games, the Olympic Flame Propane was used as fuel, which was used in comparison with previous cases of paraffin, was produced much less smoke and carbon monoxide. At the Nagano Winter Games, were used in iron recycling in making the ski jump platform.

At the Sydney Olympics, bags for trash bins, made from grain starch, paper packaging materials with food residue was converted to fertilizer, and are used in landscaping and gardens floor layout of the Olympic Games in the park. At the Sydney Olympics, under the "maintenance of the Earth's Olympics", was planted thousands of trees native to Australia, the Olympic stadiums, and more than two million trees across Australia.

During the 1996 Olympic Games, Atlanta air was 30 to 50 percent cleaner than normal weather conditions at that time of year, because many citizens were always traveling by car in the city, at the time of holding the Olympic Games used public transport.

Volunteer's uniforms, the Nagano Winter Games, were all made from recycled plastic bottles. More than 50% of plastic bottles and aluminum cans used in the Atlanta Olympics were prepared through the recovery process.

Environmental Foundation of Athens and Athens 2004 Organizing Committee for the Olympic Games in the World Environment Day (5 June) applied to coastal cleanup.

Athens Environmental Foundation, proposed a project called the crown of world olive trees, according to the program on April 19, 2003, in celebration of Earth Day, which Was held at the Hilton Hotel in Athens, Athens Environmental Foundation, and the cultivated olive tree as a symbol in a field near the hotel. From this time onward, it was decided that thousands of trees to be planted throughout Greece, and more than 1,400 schools, universities and other places, in more than 110 countries at the Olympics. Along the route the Olympic torch will attempt to planting trees, to establish a green highway. Athens Olympic champions will be awarded the crown of olive leaves as peace, environment and success [6].

The Games in Los Angeles 1932 were the first Olympic Games providing an Olympic Village. When planning the Olympic Village, one of the major factors was the climate conditions. The organizers took into consideration that most of the athletes competing were used to lower temperatures than in Los Angeles in

summer. They decided that to make the conditions more fair a location that was cooler than downtown Los Angeles should be chosen as the location for the Village. Seven locations were chosen as possible sites for the Village and the temperature was measured 24 hours a day for the months of July and August in 1931. Baldwin Hills was the coolest location (it averaged 10 degree cooler than any other location), and was chosen as the place where the Village should be built. The location, which is on sloping hills, chosen for the village had private owners and when buildings and roads were built the organizers had to make sure that no unnecessary grading had to be done. Further an underground water system, using welded steel pipes, had to be installed [7].

In a BBC article in 2006 [19] (ten years after the games), Kurt Barling discussed the legacy of the Atlanta games and drew tentative conclusions that for the city itself, the games had a sustained impact (but did not say specifically what the impacts were). For example, he concluded that, '...there is a sense that more widely Atlanta's attribute the transformation of their city to the Olympics'; and, '...a few days ago it [Atlanta] opened a new wing in its history museum dedicated to the Olympic Games. It clearly put Atlanta on the International map, but as the exhibition recognized it also gave Atlanta's an excuse to think big'; and '...last week the City of Atlanta hosted a massive outdoor party in Centennial Olympic Park to celebrate 10 years of Olympic legacy. Whilst internationally few people may recognize it, Kurt Barling considered that many Atlanta's were quietly (and not so quietly) confident that they would still be reporting fresh legacies from the 1996 Olympics in another decade's time [8].

After the International Olympic Committee awarded Beijing the 2008 Games on July 13, 2001, China established the Beijing Organizing Committee for the Games of the XXIX Olympiad (BOCOG) on December 13, 2001. The main responsibility of the BOCOG was preparing for the 2008 Games; this included infrastructure development, environment improvement, public relations, and logistics. The three main concepts promoted by the BOCOG were "Green Olympics, High-tech Olympics and People's Olympics," highlighting the importance of environmental protection and public interests [9].

In BEIJING 2008 Some 140 billion Yuan was invested in air quality improvements alone, with 60,000 coal-burning boilers being upgraded to reduce emissions; a number of public buses being converted to run on natural gas; and restrictions being put in place on private automobile use, a form of which is still in place today. There were also significant improvements in water treatment facilities [10].

In London 2012 for the first time, an independent commission was established to monitor and publicly evaluate sustainability efforts. The Commission for a Sustainable London 2012 rated the overall effort "a great success". More than 98 per cent of the demolition waste was recycled and 62% of Games operational waste was reused, recycled, or composted. Organizers also developed 45 hectares of habitat, with a 10-year ecological management plan to encourage biodiversity and 300,000 plants were planted in the Olympic Park's wetlands area. In addition, over 1,000 new trees were planted in East London. London 2012 was the inspiration for BS 8901, which led to ISO 20121, the first fully certifiable international Sustainability Management System standard [10].

Transport for London invested GBP 6.5 billion in transport infrastructure in preparation for the 2012 Games. Ten railway lines and 30 new bridges now connect London communities thanks to the Games and at least 60 Games-related projects promoted greener travel, including a GBP 10 million investment to upgrade pedestrian and cycling routes across London [10].

Olympic Games Impact Study (OGIS) to assess the likely national, regional and local impacts of hosting the Olympics in London. The OGIS was expected to quantify as comprehensively, accurately and robustly as possible the net benefit streams that would arise from hosting the Olympics in 2012 in London based on a comparison of two scenarios: 'with' and 'without' the Olympics. It was also intended to inform the development of strategies to ensure that the full potential benefits of hosting the Olympics can potentially be realized and any risks mitigated. The OGIS was designed to generate some important benefits by improving understanding of the potential benefits of hosting the Olympics in London in 2012; providing (as far as possible) consistent data. Information which can be used by the stakeholders to communicate the benefits of hosting the Olympics in London in 2012; Contributing to the development of a strategy. Action plan for delivering the potential benefits of hosting the Olympics in London 2012; and demonstrating to the IOC London's commitment to maximizing the potentially beneficial impacts of hosting the Olympics in London 2012. The OGIS has used the Framework of sustainable development to structure the analysis. Thus, it has examined three categories of impacts: economic, social and environmental [11].

MATERIALS AND METHODS

It is a mixed research methods. The mixed method research methodology is combines qualitative and quantitative research methods. This is a mixed research methods the discovery of the successive type that is the first method of qualitative and then quantitative methods. To summarize the entire research process includes the following steps: the first stage of research: qualitative research (Interviews with 25 professors and experts and Environmentalists, to achieve the theoretical saturation, reading the papers, and documents). Second phase: a Quantitative research type of Descriptive – analytical (using Friedman explains the weighting and ranking).

Using the comments of professors and experts from research and literature, a questionnaire was prepared, according to a list of physical education teachers and professionals across the country will interact with 150 professors and experts through email, and 110 people of the country and 10 abroad, a total of 120 people showed a tendency to fill in the questionnaire. Thus the sampling was nonrandom targeted sampling methods and accessible. The total sample consisted of 57 cases of sports management professors, and 53 of whom are experts in the fields of physical education and Biological sciences, across the country, and 10 professors and experts from abroad who participated in the first phase of research. Friedman test was used for the ranking of economic factors, as well as ANOVA with respect to the normal distribution.

RESULTS

In the quantitative research, through interviews with teachers and experts identified 7 variables in terms of the sum of the following this factor.

Environmental factors:

1. Development of biodiversity, 2. Improve of energy efficiency, 3. Recycling industry, 4. Cultural development, 5. Promotion of Cultural Heritage 6. Development of the transport industry, 7. Supporting the environmental industry.

The results of inferential statistics

Friedman test results in [Table 1] show that the priority of environmental factors, there are significant differences in professors and experts point of view less than 0.05. The ranking of these factors are shown in [Table 2].

Friedman test to evaluate the environmental factor, development of the hosting city in Olympic Games related to respondents Overall view showed that, Development of the transport industry is the highest rating, and Development of biodiversity is the lowest rating.

Table 1: Results of Friedman test related to respondents Overall view

Variable	Statistics	Number	Chi square	Degrees of Freedom	Significance level
From the perspective of total respondents		120	118.464	6	0.000

Table 2: Results of Friedman test rankings

Rank	Variables	Average rating
1	Development of the transport industry	5.16
2	Cultural development	4.73
3	Supporting the environmental industry	4.15
4	Promotion of Cultural Heritage	4.08
5	Recycling industry	3.45
6	Improve of energy efficiency	3.35
7	Development of biodiversity	3.09

To compare the views of teachers, experts and professors and experts from abroad to Study of environmental factors of Olympic Games on the host cities from professors and experts viewpoint and

Case study: London 2012 Olympic. Because the normal distribution and scale was quantity, we used analysis of variance test, the results of which are shown in [Table 3].

Table 3: Results of ANOVA test on the difference of opinion between environmental factors among the three groups of professors, experts and professors and experts from abroad

Barriers	Group	numbers	Average	Standard deviation	Differences between groups	Differences within groups	F Rate	Significance level
Economic factors	professors	57	3.37	0.679	1/475	52.879	1.631	0.200
	experts	53	3.57	0.694				
	professors and experts from abroad	10	3.25	0.421				

According to the results of the ANOVA are considered among the masters and experts, and professors and experts from abroad in environmental factors, there is no significant difference at $P < 0.05$.

DISCUSSION AND CONCLUSION

The Olympics have always been a golden opportunity for a host nation or city to showcase their culture, hospitality, and local attractions to the world. To most spectators these would seem to be the only reasons for hosting the Olympics.

There are many environmental impacts on a host city of a Olympic Games event, new venues and buildings are constructed, so land use has to be considered. The increase in people during the Games leads to an increase in demand for transport, water, energy and more waste get disposed. Those drivers could lead to lead to for example climate change, ozone depletion, environmental health related disease and water resource depletion. Up to the Winter Olympics in Lillehammer 1994, not much attention was paid to the environment. In co-operation with the IOC and the UNEP, a sustainable development concept was adopted, and environment became the third Olympic pillar together with sport and culture. Some of the measures taken to limit the negative environmental impacts of the Olympic movement towards more sustainable development have been to: reuse existing facilities; use natural materials for construction, conserve energy, water conservation systems, waste management, and public transportation [12].

One of the most important environmental and economic effects on the host the Olympic Games is the development of the transportation industry. Transport system is the heart of the tourism industry[13].

Transportation, transportation system improvement and optimization is including wider lanes make up the Special fast train Olympics, construction of new trails and old roads. For example, to connect multiple locations London 2012 Olympic Games, Transportation systems such as cable car was built with a height of over 50 meters that ran through the river. A water taxi will transport 2,500 passengers an hour. Olympic Park was equipped with ten rail lines that transport capacity is 240,000 passengers an hour. Nearly 2 million tones of contaminated soil have been cleaned to be reused on the Olympic Park. An estimated 6.5 million people will attend the Games and will generate over 3,300 tones of food package waste. The Olympic Stadium is projected to include 42% recycled content. 74,000 plants, 4,000 trees, 60,000 bulbs, and 300,000 wetland plants have been planted in the Olympic Park. 20% of the energy we use on the Olympic Park will be from renewable sources. 2000 newts and hundreds of toads have been taken out of the Olympic Park during construction. 90% of materials from the demolition of buildings in the Olympic Park have been recovered so they can be reused or recycled [14].

It is necessary to increase awareness and education about the environment. Community involvement is very important, and people should be aware about the environmental impact, especially the health related problems. Also, be aware of the benefits of using public transport and bicycles instead of cars. In the area of waste management, the public should have a greater understanding and awareness of recycling [13].

CONFLICT OF INTEREST

There is no conflict of interest.

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REFERENCES

- [1] Game 000. [2008] Games, O. o. O. [2008a]. Encyclopædia Britannica. Retrieved 4 June 2008. http://multimedia.olympic.org/pdf/en_report_300.pdf
- [2] Bayliss sam, Butler Simon, Klaczynsk, Michal, et al. [2004]Aspects of the Olympic Games (political, social & economic), P.3, Olympic Charter' http://multimedia.olympic.org/pdf/en_report_122.pdf. http://www.olympic.org/uk/organisation/missions/games_uk.asp. 'Organisation of the Olympic Games' by the IOC.
- [3] Gaeini A. Khabiri M. Mosayebi F. [2012) Sport Management Guide. (Adapted from the book of sports management guide – national Olympic Committee publications)
- [4] International Olympic Committee Sport and Environment Commission, Olympic Movement's Agenda 21 Sport for Sustainable Development [Accessed November 20, 2003]
- [5] Chalkley BS, Essex SJ. [1999] Urban Development through Hosting International Events, Planning Perspectives: An International Journal of History, Planning and the Environment, vol. 14, nr 4, p. 369-394
- [6] Sport and Environment Commission. [2011] www.irandl.net.BEHESHTNET.BLOGFA.COM/post-2011.aspx
- [7] Los Angeles Olympic Organising Committee. [1932] Los Angeles Olympic Organising Committee. (1932). Official Report of the Games of the X Olympiad, Los Angeles, 1932.
- [8] ATLANTA'S OLYMPIC LEGACY KURT BARLING, B.27 [Jul 2006] - *Atlanta's Olympic Legacy*. BBC London's Kurt Barling analyses what London can learn from *Atlanta* - the host of the 1996 Olympic Games.
- [9] Chen Y, Zhe Jin, G Kumar, N Shi G. [2013] The promise of Beijing: Evaluating the impact of the 2008 Olympic Games on air quality. *Journal of Environmental Economics and Management* 66 (2013) 424–443. Journal homepage: www.elsevier.com/locate/jeeem
- [10] International Olympic Committee. [2013] Legacies of the Games, 3 December 2013.p3/11.
- [11] International Olympic Committee [2013] Legacies of the Games, 3 December 2013.p2/11. Epress.Lib.Uts.Edu.Au/Dspace. [2005] [press.lib.uts.edu.au/dspace/.../Olympic Games Impact Study .pdf?](http://press.lib.uts.edu.au/dspace/.../Olympic%20Games%20Impact%20Study.pdf). (<http://www.culture.gov.au>)
- [12] Borne Yan. [2002/ 2003] The Environmental Impacts of the Olympic Games— Looking Forward to the Olympic Games 2008 in Beijing, China. International Master's Programme in Environmental Science (LUMES) Lund University.
- [13] Shokri A Moosavi, J Dousti M. [2013] Study of economic, social and environmental impacts of Olympic Games on the host cities from professors and experts viewpoint Case study: London 2012 Olympic. *International Journal of Sport Studies*. 3 (9): 984-991, 2013.
- [14] Bacconline. www.contentextra.com/Bacconline/.../Essworksheetapril2012v2.pdf. Pearson Education Ltd 2012. For more information about the Pearson Baccalaureate series please visit www.pearsonbacconline.com. Photos © Sue Webb

ARTICLE

EFFECT OF EMPLOYEES' WELFARE ON JOB PERFORMANCE OF STAFF AT THE ISLAMIC AZAD UNIVERSITY, ABADAN AND KHORRAMSHAHR BRANCHES

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ABSTRACT

Provision of staff welfare facilities is the main factor in employees' productivity and a prerequisite of productive activity. The main aim of this study was to evaluate the effect of employees' welfare on the performance of staff at the Islamic Azad University, Abadan and Khorramshahr branches. The present research is an applied one based on the objective, and a descriptive-causal study with regard to data collection method and relationships among variables being specifically based on structural equation modeling. The study sample included 150 personnel of the Islamic Azad University, Abadan and Khorramshahr branches. Data were collected using census method. A total of 150 questionnaires was distributed and the same amount of valid questionnaires was obtained from the respondents. In order to collect research data, two questionnaires were used, namely staff welfare facilities and job performance. Data were analyzed using SPSS and LISREL software. Results of structural equation modeling indicated that staff welfare facilities and its dimensions have significant positive effects on job performance.

INTRODUCTION

Some experts define management as the process of effective and efficient use of human and material resources through planning, organizing, directing, leading and controlling in order to achieve organizational goals. What this definition and the same ones imply is that increased efficiency and effectiveness is such an issue being in the focus of management measures. Organizations have primarily been created in order to achieve the goals and the rate of success in achieving organizational goals is associated with the performance of human resources working in organizations. The performance of human in many cases reflects ones' characteristic, spirit, and attitude about the universe. The difference between successful and unsuccessful people is not in things they have, but in the things that they choose and perform with the help of their available resources and also their experiences of life. Accordingly, organizational life depends on the proper functioning of employees, and managers should recognize that they can raise employees through effective management of performance, remind them of their strengths and weaknesses, and proceed toward organizational goals and objectives [1].

Paying attention to the welfare of employees has always been one of the main factors in their productivity [2]. Employees of an organization always become particularly interested in and believe in organizations based on the value that the organization respects to provide them with well-being, comfort, and safety [3]. The provision of health and welfare of employees and compatibility of the work conditions with the requirements of their physical and mental situations are no longer solely a privilege, but a humane duty and a prerequisite for the possibility of productive activities contributing to the preservation and improvement of the workforce, enhancement of efficiency, and multiplication of capital [4]. Similarly, Bell and Menguc (2002) stated that the welfare of employees is critical to their participation in the success of organization. The facilities of employees in an organization will be fulfilled by the use of techniques for the quality of working life [2]. Providing an incentive necessary to work and paying attention to motivational forces of employees account for the most important yet most complex tasks of an administrator [5]. In this research, the amenities presentable to the studied employees are in seven facility dimensions of credit, health and insurance, transportation, housing, cultural-sports- tourism, and allowances.

For decades, job performance has been a significant issue for researchers and organizations seeking ways to improve the job performance of employees through a variety of different studies [6]. However, what is observed in the organizations of the country reflects the fact that taking advantage of human resource factor is of limited utility and the lack of efficient use of these factors has caused challenges for many of the organizations [1]. Lack of attention to the needs of employees and neglecting the provision of efficient facilities will have negative and irreversible impacts on the staffs' attitude and performance. Therefore, this study is to verify whether or not the provision of welfare facilities for employees affects the improvement of job performance of staff at Islamic Azad University of Abadan and Khorramshahr.

Job Performance

The existence of any organization is dependent upon its staff. Almost all experts have identified human resources as the most fundamental factor. Hence, human resources have pivotal roles in the evolution of organization, and massive organizational changes stem from unlimited intellectual capabilities of this

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Welfare of employees,
employees'
performance, Islamic
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Abadan and
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element. In order to achieve optimal job performance and effective efficiency, organizations seek ways to optimize the environment for employees such that they attain a level of ability that is more effective on their job. Spector denotes that people are able to function well in their careers when they benefit from the ability and motivation necessary for the proper performance. Motivation is an individual characteristic, but can be derived from both oneself (as character) and environmental conditions [7]. Job performance is defined as the organizational value of an employee's job behavior at different times and positions. The organizational value is an organization's estimate of its employees' activities and services such as performing job duties or having an appropriate working relationship with other employees. An important point in this definition is that job performance has been defined as a property or certain behavioral characteristic; in particular, job performance has been considered as an integrated feature of separate and distinct behavior occurring in a range of time. The second point in this definition is that the behavioral characteristic of job performance depends on the expected value of the organization. By such a definition, the job performance can be considered as a variable between a set of behaviors performed by different people and those done by the same people at different times[8].

The welfare of staff

The present time understanding of welfare is different from that of the postmodern times, and though a greater number of theorists had scrutinized the economic aspects of welfare, social and spiritual categories have also been raised in the concept of well-being in the current age. Thus, what is discussed today as well-being is more comprehensive than the past sort of and anthropocentrism has almost replaced the exclusively instrumental and materialistic thought. In other words, in the new millennium when ideas of postmodernism have gained the opportunity to be unfolded, such issues as institutional trust, social contentment, health satisfaction, and other humanistic concepts have come together under the title of social welfare. Today, organizations realize the importance of human resources as the most important source of competitive advantage. Today's organizations are competing for the presentation of welfare programs and the amount of attention to staff to attract and retain the manpower. In response to a wave of competition for human resources, organizations invest in the implementation and improvement of staff welfare programs as well as supporting the staff and try to provide facilities and amenities for their staff as much as possible [9]. Well-being is the standard levels in issues such as health, employment, housing, income, opportunities for creativity, leisure, proper physical environment, access to local and social services and amenities, a sense of security and health, the creation of appropriate conditions for social and political participations, etc. [10]. There has been a long struggle between objective and subjective approaches with respect to social welfare. In the objective approach, the emphasis goes on the measurement of "hard measures" such as earnings or adapt to live in the same condition, whereas the subjective attitude accentuates the "soft measures" such as income and housing satisfaction [11]. This study measured the variable welfare through components provided at Azad University branches, including medical and insurance, transportation, housing, cultural, sports, tourism, and allowance facilities.

The relationship between the welfare of employees and job performance

Experience has shown that an organization can be successful only by relying on employees. Therefore, benevolent organizations always pay special attention to continuous quality improvement of working by the staff, and such a behavioral pattern of managers results in reduced wastage and improved product quality ultimately leading to increased productivity. When employees understand that the organization is concerned to their happiness and supports and assists its forces, they will assign themselves as part of the organization considering it their representation thereby having a sense of adherence and allegiance to the organization. In this case, they not only have greater incentive and work more seriously, but they reduce their resistance against stressful factors [3]. It is remarkably effective to take into account the staff incentives to increase their effectiveness and efficiency. In other words, managers pay attention to the important issue that the more effective the motivation of employees, the more the efficiency of employees [2]. The human resources are responsible for the tasks of an organization to accomplish, and their performance is the organization's performance [12].

Effective provision of staff welfare facilities is a challenge for managers and researchers to meet the different needs of employees. It is an essential principle to provide welfare facilities for staff and its effects on motivation and performance enhancement, and eventually, improvement of employees' performance rendering benefits to organizations. University staff have critical roles in the development of students with different characteristics and cultures. Their behaviors and operations are not only of functional aspects, but also of education and training features. Providing university staff with welfare will lead to satisfied employees whose job performance is not only reflected in the function of the university but also in the performance of the academics. Also, Kamkari et al. (2014) showed that welfare services are effective on the employees' performance. Ajala (2012) stated that welfare affects employees' productivity. Research conducted by Niamoamo et al. (2012) and Kambouy et al. (2013) showed that welfare services played a major role in serving performance of the employees. Logasakthi & Rajagopal (2013) studied the health, safety, and welfare of chemical industry employees and concluded that the safety, health, and well-being are among the criteria for the promotion of labor productivity. Results reported by Ahadi, Fathi and Abdolmahdi (2014) suggested that various welfare measures provided by the employer promptly affect health, fitness, physical and mental health, and ultimately improvement of overall efficiency and productivity of workers. Results presented by Rajabi, Hamidi and Jalali Farahani (2014) showed that participation in budgeting by managers had an influence on their satisfaction and commitment, and

ultimately their performance. Findings by Asgari et al. (2013) showed that perceived organizational support had a significantly positive relationship with the variable of job performance and its components. Nasiripour et al. (2012) reported that an increase in facilities will result in responding to the urgent needs associated with increased employees' accountability. Taleqani et al. (2012) noted that the general well-being of employees and considering their overall satisfaction will bring about their commitment to the organization and, ultimately, an improvement in the organization's performance. The results of Naimi et al. (2012) showed that there was a significant positive correlation between the quality of working life and job performance. Outcomes of a study by Nurodini (1384) revealed that the Karaneh (reward) plan caused the satisfaction of employees and improved their performance.

Accordingly, the following hypotheses can be considered:

Main hypothesis: the welfare of employees has a significant positive impact on the job performance of staff at Islamic Azad University, Abadan and Khorramshahr branches.

Sub-hypothesis I: medical and insurance facilities have significant positive effects on the job performance of staff at Islamic Azad University, Abadan and Khorramshahr branches.

Sub-hypothesis II: transportation facility has a significant positive effect on the job performance of staff at Islamic Azad University, Abadan and Khorramshahr branches.

Sub-hypothesis III: housing facility has a significant positive impact on the job performance of staff at Islamic Azad University, Abadan and Khorramshahr branches.

Sub-hypothesis IV: cultural, sport, and tourism facilities have significant positive impacts on the job performance of staff at Islamic Azad University, Abadan and Khorramshahr branches.

Sub-hypothesis V: allowances have significant positive effects on the job performance of staff at Islamic Azad University, Abadan and Khorramshahr branches.

Conceptual model

According to the concepts and theories explained as well as the objectives and hypotheses of this research, the following conceptual model (Fig. 1) was accepted and evaluated in order to assess the impact of employees' welfare on their performance (based on the facilities available at the Islamic Azad University branches, namely medical and insurance, transportation, housing, cultural, sports, tourism, and allowance facilities).

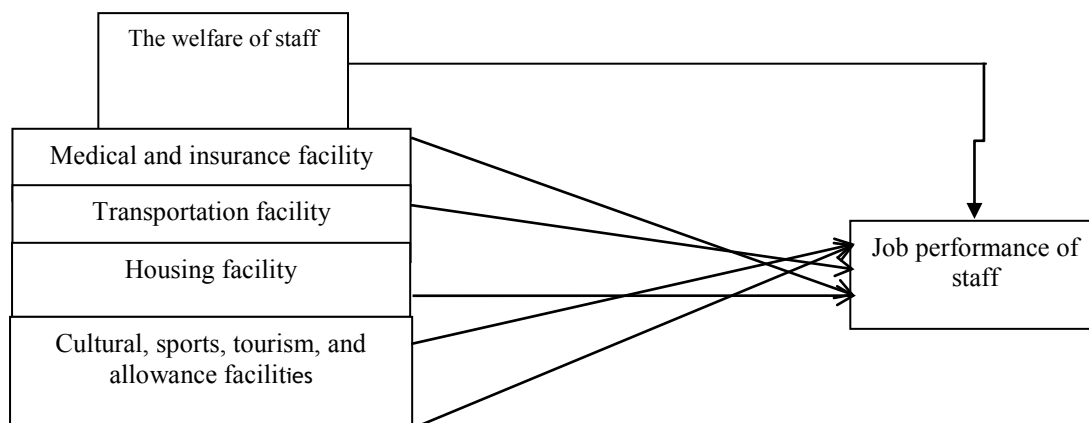


Fig.1: Conceptual model of the research (derived from research literature).

MATERIALS AND METHODS

The present research is an applied one based on the objective, and a descriptive-causal study with respect to data collection method and relationships among variables being specifically based on structural equation modeling. The study sample included 150 personnel of Islamic Azad University, Abadan and Khorramshahr branches. The census method was used for data collection. A total of 150 questionnaires was distributed and the same amount of valid questionnaires were obtained from the respondents. In order to collect research data, two questionnaires were used, namely staff welfare facilities and job performance. The questions were divided into two general and expertise questions. General questions included questions about demographic characteristics of the cognitive sample. The expertise questions were presented in the form of two questionnaires of employees' welfare and job performance.

In this study, the performance of employees was measured using Patterson's questionnaire (1992) through 15 items, which were graded based on the Likert five point scale. The questionnaire for the welfare of employees was realized based on the facilities available at the universities, namely the medical and insurance, transportation, housing, cultural, sports and tourism, and allowances amenities. This tool contains 15 items graded based on the Likert five point scale.

The reliability of questionnaires was determined by Cronbach's alpha using the statistical software SPSS. The Cronbach's alpha coefficients of 0.928 and 0.966, respectively, were obtained for welfare of employees and job performance indicating the stability and reliability of the research tool. In addition, the validity of questions was examined by two methods of content validity and factor reliability. The opinions of some specialists, academics, and experts were used to test the validity of the questionnaire content and, finally, it was ensured that the questionnaire was a measure of the characteristics meant by the researchers. The factor reliability test of the questionnaire was performed with the help of confirmatory factor analysis using LISREL software. Looking at the results of LISREL in [Table 1], it is evident that both the measurement models fulfill the mentioned conditions being appropriate models.

RESULTS

This section represents the results from confirmatory factor analysis of the measurement models and also the findings from the test of research hypotheses using the statistical software SPSS and LISREL.

Measurement model

In the structural equation modeling, it is necessary to ensure the accuracy of measurement models. Hence, the results from the confirmatory factor analysis of measurement models for the study variables are provided as follows.

Table 1. Confirmatory factor analysis of measurement models

Measurement model	Confirmatory factor analysis	χ^2	Df	χ^2 / df	p-value	RMSEA	GFI	AGFI	CFI	NFI	NNFI
Welfare of staff	Second time	93.31	85	1.09	0.25204	0.026	92%	90%	99%	97%	99%
Job performance model	First time	387.73	190	2.03	0.00000	0.045	92%	90%	99%	97%	98%

As seen in [Table 1], the results from confirmatory factor analysis of measurement models show that the main indices of fitting all latent variables are in appropriate and acceptable ranges. In other words, the conceptual models of the study are largely in accordance with the observed data.

Structural model

The structural equation modeling and path analysis were used in order to test the research hypotheses. In the implementation of structural equation model to test the hypotheses of this research, first the software output revealed the suitability of the structural model fitted ($\chi^2/df = 2.31$; RMSEA = 0.042; GFI = 0.93; AGFI = 0.91; NFI = 0.97; NNFI = 0.99; CFI = 0.99). In other words, the observed data are largely based on the conceptual model of research. Results of the structural equation modeling show that the welfare of employees has a significant impact on the job performance of staff at the Azad universities of Abadan and Khorramshahr ($t = 5.72$; $\beta = 0.66$). Therefore, the null hypothesis is rejected and the main research hypothesis is confirmed.

[Fig. 1] Structural model of research at the standard estimate

[Fig. 2] Significance numbers of the research structural model coefficients

Also, in the implementation of structural equation modeling to test research hypotheses, the software output indicated the suitability of structural model fitted ($\chi^2/df = 2.21$; RMSEA = 0.056; GFI = 0.91; AGFI = 0.90; NFI = 0.96; NNFI = 0.97; CFI = 0.98). Results from the structural equation modeling show that the medical and insurance, transportation, housing, cultural, sport, tourism, and allowance facilities significantly affect the job performance of staff at the Azad universities of Abadan and Khorramshahr. Therefore, the null hypothesis is rejected and all the research hypotheses are confirmed. However, the cultural, sport, and tourism facilities have the greatest impact on the job performance ($t = 8.96$; $\beta = 0.51$) and the medical and insurance facilities have the least roles ($t = 5.31$; $\beta = 0.42$).

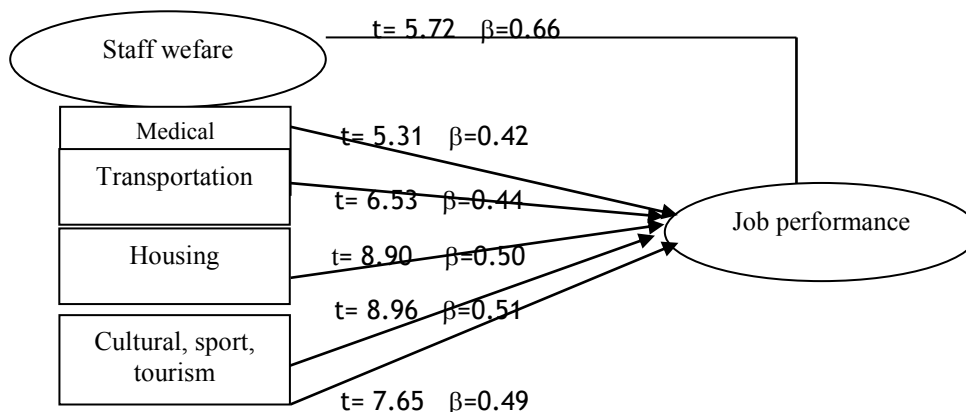


Fig. 3: The structural model of research to test the hypotheses.

DISCUSSION AND CONCLUSION

Among the most important motivational issues, which is nowadays of extensive interest in the studies of resource management and organizational behavior and affects labor productivity, is the subject of proper job functioning and the influencing predictive factors [13]. Advanced world experience also shows that human resource is the major cause of global competition that causes motivation and expedition of increased potency of organizations and, ultimately, the society [1]. Therefore, the essential resource of an organization should be administered and reared, and welfare facilities should be provided for one and the family [14] because the success rate in achieving the objectives of the organization is in connection with the performance of human resources engaged therein [1]. So, managers should afford necessary measures by improving living conditions and welfare in order for the employees' performance to increase [15].

Currently, intelligent managers know that when they invest in the field of human resources development and promotion as much as possible, they have ensured success, efficiency and competitive advantage of their organization. The success of these leading organizations depends on effective use of resources and their efficient combination in the implementation of organizational strategies [14]. Accordingly, this research tried to identify and examine the effect of amenities of employees on their performance. For this purpose, the structural equation modeling was applied to test the study hypotheses. Results of the test showed that well-being facilities had a significant positive effect on the job performance. Additionally, the components of the facility (medical and insurance, transportation, housing, cultural, sports, tourism, and allowance facilities) had significant positive impacts on the job performance.

The results indicated that the provision of medical and insurance facilities, care for the health of employees and their families, and meeting these needs of people will bring their dedication to the organization and improved performance in the organization. In order to develop medical and insurance facilities, it is recommended that employees and their dependents to benefit from insurance services even in retirement, establishment of treatment centers for university staff, expansion of knowledge in various fields of health and hygienic conditions through the creation and distribution of scientific brochures, providing information on the treatment and prevention of common diseases at the proper time. With respect to employees' transportation, paying attention and care to ease staff conveyance will lead to the their comfort and peace of mind when they attend work and home on time; this in turn will cause the employees to do their job duties with timely attendance and peace of mind. Therefore, it is suggested that administrative vehicle to be allocated for the transportation of all personnel. Assigning organizational vehicle for employees working in various administrative centers and their commuting around the city. It is also important to take care of the quantity and quality of corporate vehicles for different employees of the organization.

With regards to housing, taking into account the housing and providing conditions for a better life and comfort for employees would help them with peace of mind and making all their efforts to improve organizational performance. Thus, it is important to heed employees' requests to provide quality housing with facilities. It is also recommendable to give land, housing unit or leased residential units to employees. According to the results of hypotheses testing, sports, cultural, and tourism facilities were of greatest impacts on the job performance of Islamic Azad University, Abadan and Persian Gulf branches. However, the results of t-test showed an average status of this aspect at the above universities with an interim to

achieve an optimal situation. So facilities should be provided for the development of such amenities. It is recommended that universities hold formal appreciation ceremonies for the professors and employees with the participation of academics and their families, and invest for touristic, recreational, and scientific trips of staff as needed. Moreover, seasonal scientific conferences or various programs should be held at the university. Holding artistic competitions is also a strategy that can be applied in this regard. Other suggestions have been summarized below:

- Membership at libraries affiliated to the universities for free or half-price;
- The use of sports facilities;
- Meeting the sports competitions with dependents;
- Hajj quota and trip to the Holy Shrines;
- Paying part of the cost of travel and accommodation of employees on an annual basis.

Allocation of various grants and contributions of individuals in relation to its quality not only fulfill the welfare needs of individuals and increase their satisfaction with the organizations, but expand their efforts in doing activities in the organization.

It is recommended that regulations be established for customer pay bank loans with suitable profit to the staff. ID cards should be issued to take advantage of university facilities for employees and dependents, allowances be supplied with child care costs for employees who have children, cash allowances provided is chosen and paid in accordance with the staff condition, and decisions in relation to granting allowances be done through consulting with staff and based on their requests.

Meeting the needs of individuals and providing comfort amenities for the personnel will make them feel safe and secure in the future, ultimately boosting their commitment to the organization and their sense of responsibility to do the job and stay in the organization. Therefore, the following propositions are recommended in order to improve the overall welfare effect on employees' performance:

- Care and control of the implementation of welfare programs in terms of objectives, identification of possible deviations and suggesting modifications.
- Among the activities of interest for staff are special programs for their families. Programs such as pilgrimage tours, recreation, training courses, sports and health, supply of books and pamphlets related to the organization to increase public knowledge of families about the organization, and any other program that could cover part of the social life needs to staff; whatever the organization is able to reduce staff concerns about their families the same amount can increase the effectiveness of their work.
- Providing flexible benefits plan rather than a public one with the aim that the employees are able to choose from the benefits available. Thereby, any worker will have the opportunity to choose specific sets of interested benefits depending on the type or condition in which it is required.
- Performing welfare affairs scientifically using scientific records and experiences carried out in the country in order to increase the quality of welfare services and prepare the ground for the development of these activities.
- Strengthening the programs and activities related to the participation and cooperation of staff and the use of facilities and resources resulting from staff participation in the development of activities and support services.

CONFLICT OF INTEREST

There is no conflict of interest.

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None

REFERENCES

- [1] Ramzgooyan Gh, Hassanpoor K. [2013] The relationship between commitment and performance of employees in the Ministry of Economic Affairs and Finance, *Economic Journal*, Issues 3 and 4.
- [2] Nasiri Poor AA, Tabibi J, Habibi M. [2012] Relationship of welfare facilities with responsibility in the staff of health centers in the city of Noor, *Health & Hygiene Magazine*, Vol. III, Issue III, pp. 28-37.
- [3] Hosseini M, Mahdad A, Golparvar M. [2013] Analysis of the relationship between perceived organizational support with perceived job stress and deviant behaviors based on structural equation model, *Journal of Social Psychology*, 8th year, Issue 28.
- [4] Saghari M, Eskandari F. [2005] Professional security of nursing in the physical, mental, and social aspects from the perspective of nurses, *Birjand Quarterly Journal of Nursing and Midwifery*, 2(1).
- [5] Ann Gandalf. [2005] Why Do Nurses At A University Hospital Want To Quite Their Jobs? *Journal Of Nursing Management*, 13: three hundred twenty-seven to nine.
- [6] Tabiu A, Nur, AA. (two thousand and thirteen), Assessing The Effects Of Human Resource Management (Hrm) Practices On Employee Job Performance: A Study Of Usmanu Danfodiyo University Sokoto, *Journal of Bussiness Studies Quartely*, 5(2).
- [7] Naimi G, Mohammad Nazari A, Sanaee Zaker B. [2012] The relationship between quality of working life and work-family conflict with job performance of gander staff, *Career and Organizational Counseling Quarterly*, 4(10).
- [8] Egeie J, Khodapanahi MK, Fathi-Ashtiani A, Sabeti A, Ghanbari S, Sayed Mousavi P. [2009] Interaction between personality and metamotivational styles in job performance, *Journal of Behavioral Sciences*, 3(4): 301-310.
- [9] Taleghani, Gh., Divandari, A., Shirmohammadi, M. (2009). The impact of perceived organizational support on employee engagement and organizational performance:

- a study in branches of Bank Mellat in Tehran, Iranian Journal of Management Sciences, fourth year.
- [10] Zareiepoor, M., Eftekhari Ardabili, H., Azam, K., Movahed, A. (2012). Mental health status and its relationship with family welfare in pre-university students in city of Salmas in 2010, Journal of Research Development in Nursing & Midwifery, 9(1).
 - [11] Veenhoorn R. (the 2,002th), why social policy indicator subjective needs, social indicators research, 58: 33-45.
 - [12] Isfahani S, Kamkar M, Raie M. [2005] The relationship between factors affecting the employees' performance of Islamic Azad University, Mobarakeh branch and satisfaction of students with the staff operations, Knowledge and Research in Applied Psychology, Issue 24.
 - [13] Babaeian A. Samani, Y. Karami Z. [2014] The relationship between personality traits and job performance of NAJA mission categories, The Scientific-Promotional Magazine, 9th year, Issue 37.
 - [14] Roghani S. Abzari, M. and Soltani, A. (2012). Identification of key indicators to measure performance for compensation, Development and Management Process, 25(81).
 - [15] Ahadi B Fathi, A Abdolmohammadi K. [2014] Survey of Psychological Factors Affecting the Job Performance of Police Command of East Azarbaijan, East Azarbaijan Disciplinary Knowledge Quarterly, 4th year4 (S. 15).
 - [16] Rajabi M, Hamidi M, Jalali Farahani M. [2014] The effect of budgetary participation on job attitudes and performances of physical education managers at universities, Research Paper of Sport Management, 6(4).
 - [17] Taleghani, Gh. Tanaomi, M., Farhangi, A., Zarrinnegar, M. [2012] Factors influencing the increase in efficiency (Case study: Saman Bank), Governmental Administration, 3(7).
 - [18] Ajala EM. [2012] The Influence of Workplace Environment on Workers Welfare, Performance and Productivity, The African Symposium, 12(1).
 - [19] Bell SJ, Menguc B. [2002] The Employee Organization Relationship, Organizational Citizenship Behaviors, And Superior Service Quality, Journal Of Retailing, 78: 131-146.
 - [20] Kamkari K, Ghafourian H, Ghadami MH. [2 014] Welfare Services and Benefits Impact on the Performance of Staff of the Inspector General Organization, Journal of Applied Environmental and Biological Sciences, 4 (3):114- 119.
 - [21] Kamboi, A. Ceoffrey, BK Thomas, TK Keter, CJ (2013). Staff Welfare as an Antecedent to Service Delivery among Civil Servants in Kenya a Case Study of Nandi County, European Journal of Business and Management, 5(22)
 - [22] Logasakthi K. Rajagopal K. [2013] A Study On Employee Health, Safety and Welfare Measures of Chemical Industry in the View of Salem Region, International Journal of Research in Business Management, 1(1).
 - [23] Nyamwamu WB, Atambo WN, Munene C. [2012] Role of Employee Welfare Services on Performance of the National Police Service in Kenya: A Case of Kisii Central District, International Journal of Arts and Commerce, 1(7)

ARTICLE

PROPOSING A TRANSITION STRATEGY FORMULATION BASED ON BUSINESS MODEL: A CASE STUDY IN GENERAL CONTRACTOR COMPANY

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ABSTRACT

Environment is the head player in businesses life cycle because of changes that it dictates during the companies evolutions. The modality of responding to alterations leads enterprises to successfulness or failure. The more essential changes are, the more accommodations are required. This article describes such circumstances for a general contractor company which encountered a sudden change and proposes a simple approach based on business model, environment assessment tools and risk analysis in order to formulate strategies for relocating the business to the new position.

INTRODUCTION

As time passing through twenty first century enterprises face increasing in rate of business changes and how they choose to adapt with this dynamic environment become more critical and controversial. Occasionally, changes are unpredictable or haven't been deal properly which then need emergency decisions. In the case of encountering such suddenness, it must be chosen whether accepting unsuccessful or taking approach in order to coordinate which almost lead to review in business execution immediately. Responding to changes means reformulation current strategies and redesigning business model subsequently.

This research is conducted to study an Iranian general contractor working in constructing steel plants as a case that has faced an alteration rooted in political environment. The Company was placed behind a strong barrier in its contracted projects because of the change and decided to choose a new strategic goal by developing its value chain and becoming a technologist in the class of designing steel plants. But the main question is *how does this company alter his business model and strategies quickly?* Or in more comprehensive point of view *how does this company deal with changes?* Some studies have done around this concept by applying future approach in business model and assess the external environment but the fact that has been missed is the effectiveness of internal environment because its factors must also be readjusted. This article proposes a simple model consisting of performing SWOT analysis, IE matrix and risk assessment in business model components in order to formulate guidelines as transition strategies.

Literature review

Internal-external analysis

SWOT as a technique provides a frame work for identifying the enterprise situation in a particular industry from both internal and external points of view. The four letters of SWOT stand for Strengths, Weaknesses, Opportunities and Threats. Concept of this analysis came first from the study conducted at Stanford Research Institute from 1960-1970 to find out what had gone wrong with corporate planning and to create a new system for managing change [1], from that time it has been widely used in researches.

This tool has some limits which have been discussed in many articles; the most important is its disability of categorizing and prioritizing strategies. For overcoming the constraint, decision making approaches have also been applied. The process of this technique contains two steps as following:

- Identifying key factors in each four categories by Delphi analysis or brainstorming among a group of industry professionals and creating SWOT matrix.
- Combining identified factors to define four pair wise SO, ST, WO and WT groups of strategies.

Other tools which have usually exerted with SWOT are EFE (External Factor Evaluation), IFE (Internal Factor Evaluation) and IE (Internal-External) matrices. EFE allows strategists to evaluate economic, social, cultural, demographical, environmental, political, governmental, legal, technological and competitive

KEY WORDS

Business model, SWOT analysis, IE matrix, Risk analysis, Transition strategies

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information when IFE assesses the major strengths and weaknesses in the functional areas of a business [2]. As a concluding approach, IE matrix positions an organization's various divisions in a nine cell display [2] based on IFE and EFE total weighted scores as illustrated in [Fig. 1].

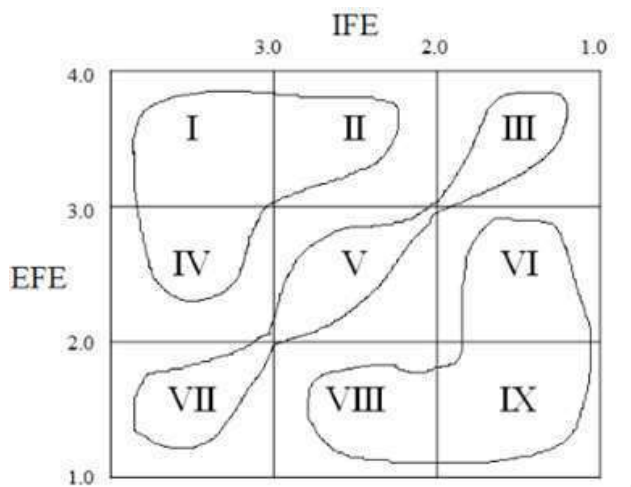


Fig. 1: IE Matrix. Source: [2]

Those cells can be considered through three main regions with different strategy. First, the prescriptions for divisions that fall in to cells I, II, or IV can be described as grow and build. Intensive (market penetration, market development, and product development) or integrative (backward integration, forward integration, and horizontal integration) strategies can be most appropriate for these divisions. Second, divisions that fall in to cells III, V, or VII can be managed best with hold and maintain strategies; market penetration and product development are two commonly employed strategies for these types of divisions. Third, a common prescription for divisions that fall in to cells VI, VIII, or IX is harvest or divest.

Some recent related studies are cited below:

- [3] defined and prioritized the Iran's scrap strategies with ANP-SWOT approach.
- [4], formulated strategy using SWOT technique combining with important-performance analysis.
- Christopher M.Cassidy et al 2013, suggest visual mapping of the External Competitive Profile Matrix (ECPM) and Internal Competitive Profile Matrix (ICPM) in a manner similar on the Internal-External (I-E) matrix to enable greater comparative understanding of the relative strengths, weaknesses, opportunities, and threats of the respective companies.

Business model

Business Model which in this study is abbreviated to BM is a story that explains how enterprise works. A good model answers Peter Drucker's age old questions: Who is the customer? And what does the customer value? It also answers the fundamental questions every manager must ask: How do we make money in this business? What is the underlying economic logic that explains how we can deliver value to customers at an appropriate cost? [6]. From this definition main players of this model reveal which are customer and proposed value to them, cost and revenue and channels for following through.

Business theoreticians have organized these items in to different taxonomies applicative to their purposes. Mahadevan [5] defined three streams for his model; value, revenue and logistical. Afuah and Tucci [6] decomposition their model to eight components: customer value, scope, pricing, revenue source, connected activities, implementation, capabilities and sustainability. Osterwalder [7] named his model Canvas and framed it based on nine components: customer segments, value propositions, channels, customer relations, revenue streams, key resources, key activities, key partnerships and cost structure. Bouwman et al (8) named their model as STOF which is stand for Service, Technology, Organization and Finance.

Among mentioned models, Canvas is the most comprehensive template [9]. Osterwalder and Pigneur [10] published a book to visualize and describe this model and also suggested assessing

BM components in detail by using SWOT analysis and utilize the results as a foundation for its change.

Risk

Risk is related to what can happen in the future [11] whether positive or negative which has roots in internal and external enterprise circumstances and managing risk is about managing effectively in a risky and uncertain world [12] to maximize merits and diminish demerits. The central part of risk management is risk analysis that is a proactive approach with three main steps:

- Identifying and categorizing risks by sources of them [13]. SWOT analysis is one of the practical techniques for defining the sources of risks.
- Assessing them with qualitative or quantitative analysis
- Planning how to response to risks with strategies

The concept of risk was used by many scholars from different industries and in various fields from safety to supply chain and business model. Sisodia et al [14] proposed model for business risk in renewable energy segment with Monte Carlo and net present value techniques. Ghazinoory et al (15) applied qualitative risk analysis with decision making tree in order to develop scenario for finding business model orientation. Yao Zhang et al [16] focused on risk interdependence and constructed an optimization model for selecting risk response strategies.

METHOD

The chosen approach by this article as illustrated in [Fig. 2] in the case of changing in company existing BM because of its new strategic aim is proposing a transition strategy formulation to fulfill the gap between first and second BM to prepare company at least for being alive before the stage of development. This formulation includes three steps:

- First: Applying SWOT analysis in BM components separately for internal and external market before strategy proposing stage and mapping company position in each part on IE matrix
- Second: Identifying risks based on weaknesses and threats from SWOT matrix and preparing risk break down structure based on BM then analyzing them with qualitative approach
- Third: Designating risks responses as transition strategies



Fig. 2: Chosen Approach for Considering Changes.

Defining the position of each BM component

An expert team from inside and outside of company analyzed the potential customer segments in internal and external markets for near future and the other eight components were arranged on the basis of existing abilities and minimum requirements of this new business part. Another team comprises of ten expertise familiar to this industry and also the considering company were invited to contribute in this research for applying SWOT analysis as [Fig. 3].

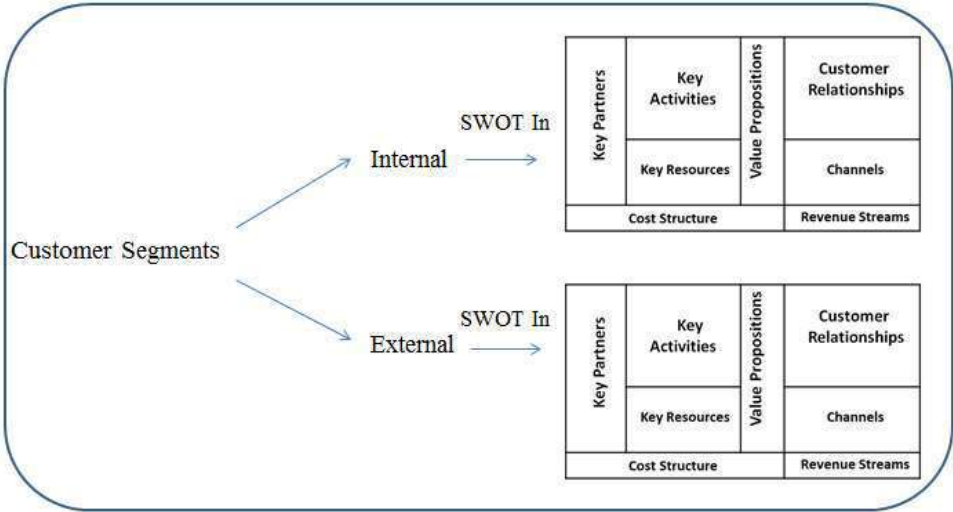


Fig. 3: Pattern of Applying SWOT Analysis.

In the phase of identifying SWOT factors Delphi analysis and semi structured questions were put in and for weighting them expert team answer to structured questionnaire with five selection switch to be conform to likert scale. The next step is ranking each SWOT elements that was done by 100 company masters in related disciplines. Figure 4 and 5 demonstrates the position of company respectively in interior and exterior markets in each building block of BM which are labeled as VP for value propositions, CR for customer relationships, CH for channels, KR for key resources, KA for key activities, KP for key partners, CS for cost structure and lastly RS for revenue stream.

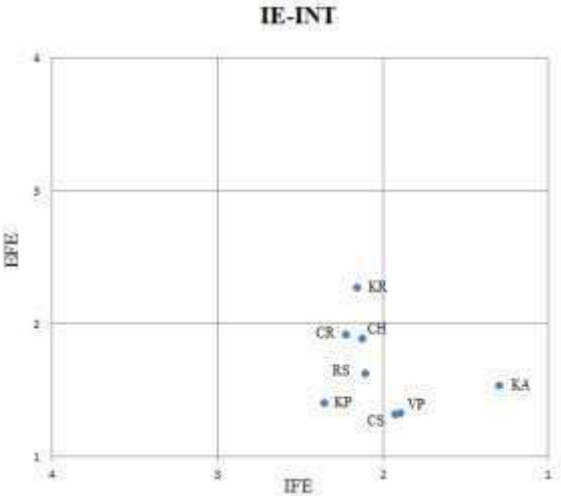


Fig. 4: Map of BM Components in Internal Market Segment.

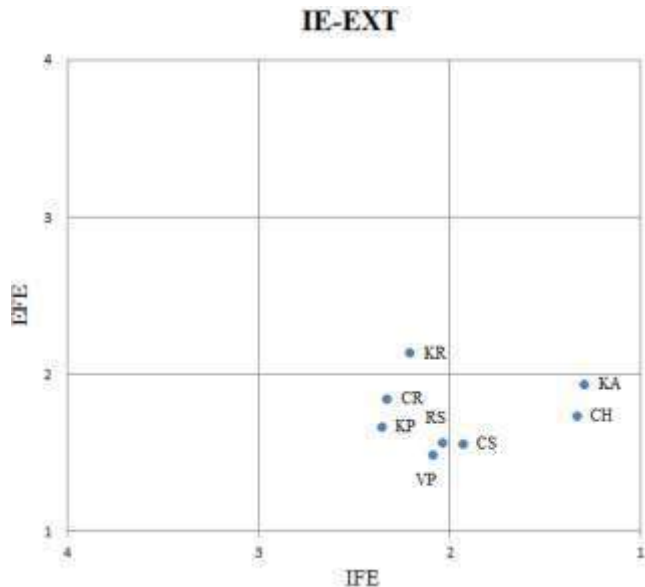


Fig. 5: Map of BM Components in External Market Segment.

As it can be seen, almost all elements positions except key resources are in third division of IE matrix with harvest and divest strategy recommendation. For further assessment this article suggests risk analysis in each BM building block.

Assessing risks with qualitative analysis

In this step with regard to company position expert team was requested to draw main risks out from weaknesses and threats in a brainstorming meeting which led to two scenarios based on sanctions against Iran. Then a risk break down structure was provided for categorizing uncertainties based on their potential causes in BM components as illustrated in [Table 1]. The risk areas haven't got the same divisions so sub levels are defined after level 3.

Qualitative risks analysis assesses the priority of identified risks using their relative probability or likelihood of occurrence and the corresponding impact (PMBOK 5th) on each element's function if risks occur. For performing these analysis two questionnaires with five responses likert scale were prepared to cover BM components risks in both customer segments.

Every risk has selection switches from very probable to not probable for likelihood and very high to very low for impact. Each of the scales is converted to the numerical measures and the score of risks are calculated by equation (1). These measurements can be depicted by 5×5 matrix as shown in [Table 2] and [Table 3] shows the maximum results of risk assessment in BM components by summing risk rates in each part. Equation (1) $R_i = P_i \times I_i$

Where R_i is the score of risk i , P_i and I_i are respectively the average of probability and impacts from the experts responses.

Table 2: Probability-Impact Matrix

Impact	Very Low	Low	Moderate	High	Very High
Probability	(1)	(3)	(5)	(7)	(10)
Very Probable (10)	10	30	50	70	100

Some What Probable (7)	7	21	35	49	70
Neutral (5)	5	15	25	35	50
Some What Improbable (3)	3	9	15	21	30
Not Probable (1)	1	3	5	7	10

Table 3: Results of risk assessments

Components	Internal Market Rate max($\sum \times$)	External Market Rate max($\sum \times$)
Value Propositions	230.3	214.8
Customer Relationship	15.1	9.4
Channels	46.9	207.5
Key Resources	162.2	205.1
Key Activities	50.4	119.3
Key Partnerships	10.0	23.5
Revenue Streams	29.4	56.2
Cost Structure	39.7	78.4

According to [Table 3] the orders of BM building blocks from the most risky to the least one in market segments are:

Internal Market: Value Propositions > Key Resources > Key Activities > Channels > Cost Structure > Revenue Streams > Customer Relationship > Key Partnerships

External Market: Value Propositions > Channels > Key Resources > Key Activities > Cost Structure > Revenue Streams > Key Partnerships > Customer Relationship

For determining the criterion of top risks, this article suggests using weighted arithmetic mean between averages of risks ranks as a representative of each BM components for including both important factors: the risks ranks and also the number of uncertainties in each element which are not the same. [Table 4 and 5] shows the calculation of top risk indicator.

Table 4: Internal market top risk indicator

Components	Average*	Number of Risks (n)	Top Risk Indicator** (TRI)
Value Propositions	25.6	9	$TRI = \left(\frac{\sum_{j=1}^8 Ave_j \times n_j}{\sum_{j=1}^8 n} \right) = 16.2$
Customer Relationships	7.6	2	
Channels	11.7	4	
Key Resources	14.7	11	
Key Activities	12.6	4	
Key Partnerships	5.0	2	
Revenue Streams	14.7	2	
Cost Structure	19.9	2	

* Average as a representative character of each component which is abbreviated to Ave

** Top risk indicator calculated from weighted mean which is abbreviated to TRI

Table 5: External Market Top Risk Indicator

Components	Average*	Number of Risks (n)	Top Risk Indicator** (TRI)
Value Propositions	26.9	8	$TRI = \left(\frac{\sum_{j=1}^8 Ave_j \times n_j}{\sum_{j=1}^8 n} \right) = 22.3$
Customer Relationships	4.7	2	
Channels	34.6	6	
Key Resources	14.7	14	
Key Activities	29.8	4	
Key Partnerships	11.8	2	
Revenue Streams	28.1	2	
Cost Structure	26.1	3	

* Average as a representative character of each component which is abbreviated to Ave

** Top risk indicator calculated from weighted mean which is abbreviated to TRI

Designating transition strategies

By categorizing uncertainties with ranks more than top risks indicators beyond the BM classifies as action needed parts and prioritizing them based on their ranks the considering list was prepared. Then strategic team responded to the list in brainstorming meeting in the way that is shown in table 6 and 7. As mentioned in PMBOK standard replications to different risks can be classified in four main strategic groups: Avoiding, Mitigating, Transferring and Active acceptance.

DISCUSSION

SWOT analysis and IE matrix were applied to define the BM component's positions by assessing current capabilities of the company from the view point of new BM. As illustrated all building blocks except key resources are in third portion of IE matrix with harvest or divest strategy that is not appropriate situation for a company chooses new strategic goal. Being alive generally means at least be in cells VII, V and III with maintain strategy. These positions of components can be explicated in two ways:

- First, existing BM is in the maintain stage not in the development so the company is not mature enough for this change.
- Second, the first BM is in the developing stage but the occurred change was more than its throughput and this also means that the company is not enough grown up for responding to the change.

For key resources results are different and they are in cell V which enunciates that although it is not appropriate time for this company to change, resources are enough for performing new BM. It is a fact that in IE matrix for this case as much as the positions are further from the maintain portion, the bigger strategic gaps are and they need more modifications. So just as depicted in figure 4 and 5 for internal market KA, CH and CS and similarly KA, VP and CS in external market are visually the critical elements. These components need urgent solutions for both IFE and EFE aspects.

Risk analysis was also done to assess the BM components more precisely and prioritize the required strategies for transferring company to new BM. Inferences drawn from analysis show that in internal segment; value propositions and key resources are the most critical parts whilst for external market exigent parts are value propositions, channels and key resources. Comparing results from IE matrix and risk analysis reveals that although key resources are enough for executing new BM, its benefits can be lost because of risks it has. So IE matrix can't define the guide route solely.

Whereas the different number of risks were defined in each building block, not only risk ranks but also the multiplicity of them is important because medium or low rank risks can be occurred concurrently so weighted mean was applied for defining top risk rank in order to reflect the influence of this issue. Then top risks were defined and expert team responded to them in four main groups depend on company abilities and capabilities. The outcome show that despite the fact that in many researches external factors were assumed to be the most risk drives, as displayed intra organizational factors has also considerable number of top risks in each market.

CONCLUSION

It has been inevitable for firms to be confronted with changes from their outside environment so they must dispose them properly and modify their business model and strategies. The first step of this alteration is about finding the company position with in the new condition and evaluate the distance between what it is and what it need to be for at least being in maintain situation. Therefore factors from inside of company as well as outside forces must be dealt with. Prioritized list of strategies can show the guideline through this transition and in rapid alterations risk analysis can be an appropriate tool. In order to expanding mentioned concepts this article recommends agility analysis in business model which can consider both internal and external factors in business.

CONFLICT OF INTEREST

There is no conflict of interest.

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None

REFERENCE

- [1] Humphery AS .[2005]SWOT Analysis for Management Consulting”, Newsletter of SRI Alumni Association, December. 7-8.
- [2] David FR. [2011] Strategic Management: Concepts And Cases, 13th ed. New Jersey: Pearson,
- [3] Shakoor Shahabi R, Basiri MH, Rashidi Kahang M , Ahangar Zonouzi S. [2014]An ANP-SWOT approach for interdependency analysis and prioritizing the Iran's steel scrap industry strategies”, Resources Policy, 42: 18-26.
- [4] Zhang Y. [2016] Selecting risk response strategies considering project risk interdependence”, International Journal of Project Management, 34: 819-830.
- [5] Mahadevan B.[2000] Business Models for Internet – Based E-commerce: An Anatomy, California Management Review, 42:55.
- [6] Afuah A, Tucci CL.[2003] Internet Business Models and Strategies: Text and Cases” McGrawHill
- [7] Osterwalder A.[2004] The Business Model Ontology-A proposition in a design science approach, Dissertation, University of Lausanne, Switzerland,
- [8] Bouwman H, De Vos H, Haaker T. Editors, “Mobile Service Innovation and Business Models”, Springer, (2008).
- [9] Ovans A. What Is a Business Model?, Harvard Business Review, (2015) January.
- [10] A. Osterwalder, Y. Pigneur, Editors, “Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers”, Wiley, (2010).
- [11] Rausand M.[2011] “Risk Assessment: Theory, Methods, and Applications”, Wiley,
- [12] Anderson E J. Business Risk Management: Models and Analysis”, Wiley, (2014).
- [13] A Guide to the Project Management Body of Knowledge (pmbok Guide)”, Newton Square, Pa: Project Management Institute, (2013).
- [14] Sisodia GS, Soares I, Ferreira P. [2016] Modeling business risk: The effect of regulatory revision on renewable energy investment- The Iberian case”, Renewable Energy, 95: 303-313.
- [15] Ghazinoory S, Saghadi F, Mirzaei M, Ghahfarokhi MB, Ghahfarokhi PB, [2016] Future Approach to Find Business Model Orientation for Technological Businesses”, Information Technology: New Generations, 448.
- [16] Phadermrod B, Crowder RM, GB Wills, “Important-Performance Analysis based SWOT analysis”, International Journal of information Management, Apri, (2016).
- [17] Cassidy CM, Glissmeyer MD, Capps CJ. [2013] Mapping an Internal – External Matrix Using Traditional and Extended Matrix Concepts”, Journal of Applied Business Research, 29
- [18] Magretta J. [2002] “Why Business Models Matter”, Harvard Business Review

ARTICLE

WOMEN'S POLITICAL PARTICIPATION, OBSTACLE AND FACILITIES

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ABSTRACT

One of the most important question is about the women's political participation and producing the required field for them. It is possible to investigate this issue and to found a suitable reply for it. Actually, it is vital to recognize the women's position and their roles to do recognize the women's position and their roles to do this, women should try consciously with their powers to demand their appeal in different levels, since, they can't meet their real identity and social in addition to individual development unless they a basic changes in their evolutionary process. Nowadays, the world has become as a communicational small village at the second millennium. Further, the human's problems such as women's issues cannot be solved by national and group policy. It is obvious that the women include half population of the world. Thus, the global planers and politicians should determine the special position of the women in creating the strategy in order to attain a unique and complete development. The aim of this study was to investigate the systematic and exact women's position in their political participations and their roles to improve completely. moreover, the purpose was to specify the theoretical and practical points of this view in order to show it's obstacles and facilities, and also suitable strategies in addition to create some fields for women's more participations.

INTRODUCTION

Nowadays, the concept of political participation has undergone the terminologically profound changes. Previously, participation just meant the interference for one's participating or taking part in an affair. However, it isn't defined as a behavior based on one's willing to interfere in an affair at present time. Political participation which is one of the most prominent ones means appearance in election field whether to elect or to be elected, in order to interfere in decision making area to decide about major and minor political issues relating to the social ends. Political participation has different levels, from the lowest that is to vote and to the highest one that is to have the political or official rank. On the other hand, political participation beings from voting then it contains having little interest toward politic, participation in informal political sections, dismissal membership in a quasi-political organization, and looking for the political and official status. As the women are half of the human societies, they must participate effectively in such issues as political processes. In recent years, all planners consider to the importance of the women's roles in the political and economic activities to develop the country and to revitalize the government's unit and their countries' ability toward achievement.

The concepts of existing research are: political participation, common political participation, particular political participation, the lack of political participation, and socio-political participation. The following statements are the explanation of them.

The major question of the research are:

- 1- Is women's political participation a social necessity?
- 2- What are the obstacles on the way of women's political participation?
- 3- What are the appropriate strategies for women's political participation?

The main research hypothesis was based on:

- 1- It is essential to strengthen the women's political participation because it is considered as a determinant factor for the social development of Iran. In addition, the less attention toward this issue, the more delay will be put on the development history of this country. As a result, the golden opportunity may not gain at all.
- 2- (A)- The women's obedience from their husbands in their political behavior.
(B)- Women's conservatism as a political point of view.
(C)- Women's conventionality as a political point of view.
(D)- The politic elusion feeling of the women as a political point of view.
- 3- (A)- The creation of the required opportunities to establish feminine societies, institutions, and organizations to become aware of existing qualities and potentials.
(B)- To hold the educational courses for women and to make them familiar with their rights. To prepare the backgrounds to cause women's self-belief and awareness of their individual abilities and potentials.
(C)- To hold the seminars and to form educational workshops in order to make managers, politicians, and planners familiar with the sex category and also the benefits of women's more effective presence in high ranks of decision making.
(D)- To encourage of the managers who uses the women in high levels of the organization and makes required opportunities for them to show their own potentials.
(E)- introducing the superior women in addition to compare their performance with the same level men.
(F)- To do all of the mottoes which governing body promised to do about women before the election.
(G)- To investigate the scientific researches about women especially such issue as their occupation, management, and role in the development of the country.

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Political participation

According to social sciences encyclopedia, the political participation includes the voluntary the political participation includes the voluntary and conscious activities conducted by the members of a society to elect the governors either directly or indirectly toward the formation of the general policies. The authors of sociology dictionary defined it as the participation of the individual in political affairs leading to the election of the political leaders and designating the general one or affecting it [1]. Guglielmo Ferrero also writes that democracy is just the principle of conducted in the society in order to solve the government's problems. The sovereignties agree with each other to select a few informed individuals to govern the public gains [2].

Common political participation

Common political participation, called partial or selective participation, presenting mainly in the societies in which political and democratic civil organizations participation are dominant. In existing society in Iran also because of the shortage as well as the lack age of the varieties in the different political dimensions and forms, it is obvious that participation in the election is the chief index of political participation in this country.

Particular political participation

The forms and dimensions of the particular political participation range includes membership of the political groups and parties, collecting the vote for candidates, registering for being in charge at a political post, giving financial aid to the election centers, encouraging others to vote a given individual, presenting speech, writing articles, taking part in the political demonstrations, taking refuge in a sanctuary, going on strike, and so on.

The absence of the political participation

The absence of the political participation means the complete refusal from the participation in political relationship of an individual in addition to his (or her) actually and fields. The individual completely negates political issues. While rejecting the dominant political structure, the person clearly is unwilling to take part in political activities.

Sociopolitical participation

The political participation will be the best social activity and also the base of the life if the participation in the political affairs means the consciously participate and interface in the political affairs of the society. The political participation belongs to the people. Moreover, it is all of the people's right. Actually the women's political participation is very important in a community because it results to decrease the durable development indices for the United Nations cited "we know that it's important can't be achieved unless the women have their shares in it. That is, the barriers on the women's participation in decision making must be removed and their political and human rights should be thoroughly warranted." [3]

MATERIALS AND METHODS

The study's method is descriptive – explaining, along with critical view has.

RESULTS

Generalities about the women's political participation:

Historic background

The precedent of the women's political movement and its ideas dated back the France Revolution Olympe de Gouges, the French author of declarations about the citizen and women's rights to go on the oration platform as the rights to be executed In 1791[4]". Over the France Revolution, women engaged to shape the revolutionary clubs. The fans of the feminism protested to the National Assembly and wrote "you destroyed all previous biases; however, you allow to remain the most common and the society to be deprived of the position, respect, and particularly the attendance in the Assembly." [5].

Over the first half of the nineteenth century, the adherents of the nineteenth century, the adherents of San Simon & Fevrie, two early socialists, supported the women's right. At the second half of equality in the social and political affairs was clearly proposed. Generally, the first women's movements were triggered by

the small groups of educated women from middle class of the society. As a result, their movements were not popular.

In Iran, this movement dated back to the late of the nineteenth century especially during Iran constitutional movement. Due to the paternalism culture of the traditional society, the dominant perspective toward women was contemptuous. So, the women could have no opportunity to participate in political activities in Iran at that time. [6].

Women's role in politic world

In recent years, women have made considerable strides in most countries, yet their movement was along with many vacillations. In a probe with hundreds of women who were managers in more than thirty countries, it was suggested that they tended to work at the private companies than the political and official ones. The most competent and effective women prefer to be away of the politic and to hold a nongovernmental company. This is regrettable since they must be useful in the global issues and must utilize their merits and thoughts in the political affairs.

According to a recent report of world economic assembly about 115 countries, the sex gap between men and women were filled about 90 percent in educational and hygiene fields, nevertheless this rate reduced at 15 percent in political affairs of the countries throughout the world. Further, the recent reports have suggested that only 17 percent of the parliamentary positions of the world and 14 present departmental ones were women. Moreover, most of them have been resulted from their relatives. The U.S also follows these patterns, from 100 senate members just there are 16 women and 71 women from 435 congress members. However, the grade of the U.S.A about this matter is 68 from 189 in the world. This country is even after a few Latin American countries.

This is different about nongovernmental organizations in which women are at the high levels of leadership and there are fewer barriers on their ways. In the U.S. there are ten million women in 230 nongovernmental organizations. Women also lead many philanthropic organizations such as Bill, Melinda Gits, and Ford Foundations. The chancellor of Harward, M.I.T, and Princeton universities are also women.

Most of the countries follow the same pattern. After the former Soviet Union had collapsed, the number of the nongovernmental organization was highly increased. The main pivot of them has been lately the women. In the East European parliaments. In these countries, this amount was approximately 33 percent over the communism territory. In 1997, this rate decreased to 17.5 percent of nongovernmental organizations in Kyrgyzstan are managed by the women, but even ones of them doesn't participate I the parliament at the end of former U.S.R in south Korea, the rate about nongovernmental organizations is 80 percent and about the women's participation in parliament is less than 14 percent. This is also true in Africa. Although women have advanced mostly in managing nongovernmental organizations, their experiences also must be used in political affairs[7]. One of the previous president candidates in Sierra Leone was a woman called Zeinab Bangoor. She said " women's real power is not in their social activities but is in their political decision making."[8]

The women's participation achievements in politics

There are many considerable achievements in participating of the women within the politic filed.

According to a research of world Banks, there are less economic and political corruption. Another research suggested that women receive a bribe less than men. Uri Genzi conducted a research on a college in San Di Ego University; he claimed that women are more reliable than men. Electing of the women for leading situation will be along with a good politico-economic situation. There is a significant relationship between the women's strengths and the economic competition increase [8]. Augusto Lopez-Claros, Previously he was Chief Economist and Director of the Global Competitiveness Program at the World Economic Forum in Geneva, presented the findings of a 2016 World Bank report on "Women, Business, and the Law," said "the North European countries found out that the presence of the women I found out that the presence of the women In political positions has many valuable ad economic achievements. In addition, the countries which don't pay attention to their human resources will previously destroy their competitive potentials."[9]

While women were conducting the civil societies, the moral standards were considered more than men. Mrs. Hannah Riley Bowles, the profession of Harvard university in general politics, stated that American women negotiate 15 percent less than the men when they discuss about their professional interests; however, the naturally spend much more time when they talk as a representative of the others. And advocate their client in a positive way.

Further, the women who negotiate about political issues try to resolve the conflict completely rather than to settle it partially. They follow a brood definition of the security including social security, economic safety, and food as well as water security. In addition they protect the feminine sex in the war. They also negotiate with the old enemies more powerfully than the men.

The barriers and the strategies of the women's political participation

Cultural barrier for women's political participation

Sociologists believe that there are mostly some patterns about the cognition of the women's political behavior as following:

- 1- Women follow their husbands in the political behavior.

- 2- Women are conservative about political issues
- 3- Women are traditional in political issues
- 4- Women evade politics

It is implied that above statements were man-centered because there were a paternal system at previous historical conditions. Susan Berk & Jane Gross Holter (1974) stated that most man-centered investigators mostly interpreted the data in terms of their previous ideas about women's political behavior. It must be cited another point that there is an inevitable principle considering the experienced political behavior is unique to the men. Accordingly, it is thought that women's political interests are embedded in their maternal frame. As a result, their political potential will be limited. It seems that over the history paternalism culture not only has been a barrier to the presence of the women in political field but also has interpreted the politics in a way that reworded the man's intentions and interests. The men have always believed that family and morality interests are related to the women [10]. This has actually been a barrier on the way of the women's growth in the political affairs.

Thus, the human culture has yielded many barriers for women's participation in politics by two ways as following:

- 1- The dominate paternalism culture doesn't provide opportunity and potential activities of the women in socio-political areas through its images such as women's inability, lack of management, weakness, etc. even if it prepares such a situation, it will be hard with value.
- 2- The arena of political participation was made so that it is formed just in terms of masculine interests, and engaging to the women's problems is considered as a feminine issue!! In other words, the political discussion of the women is considered insignificant as all of the previous time. In Iran, the women's political problems are allowed to be considered in a limitation determined by the men for them. For example: How they are allowed to talk about human rights and particularly about women's rights just as a person and a human being and not as a mother or as a wife, and so on. Do the women have the right of life, freedom, and speech just as a human being? If politics means the technique of the affairs management, where is the place of the women's issues in these affairs?

The idea concept of the politics organizing the human life based on the pleasant and logical principles so that the imagination of power assertion is completely removed. But this isn't really true about what actually known as politics. Nowadays, politics is the method of governing a country and also includes all authority structures and plans which a group exerts another ones.

In the paternalism societies, the men have control on all organizations, industries, technologies, sciences, as well as political and military positions specially the police. The relationship between men and women are similar to that is among races and are base on excreting the force against the others through the governing ones. Therefore, the paternalism culture is a power impose system that makes and exerts for the individuals some roles considering are divine and natural [11]. Accordingly, the women's political participation has been discussed for years. Therefore all rules about this issue are superficial and temporal until the existing culture and mental structures in the society be undergone basically the positive alteration about the women. In addition, the women also must believe their capabilities, merits, and potentials. They should believe that their tendencies, needs, and appeals as another half of the society must be considered and they should have the same rights as the men. Since they are the complementary parts for the men. Consequently, there is no complete development in a society unless paying real attention to the women's tendencies, needs, and capabilities.

Appropriate strategies for women's political participation

In order to solve above problems and to prepare more suitable conditions to activate the half of the society, the following strategies can be offered:

- 1- Actually, the main key of success is the group Endeavour of the women themselves.
- 2- The women's organizations, private or public, must be work in a concentrate way to have considerable power to change the cultural conditions and also to make the organizations so as to enhance the women's political abilities. These networks must be established and reinforced based on group profits.
- 3- The United Nations plays on important role for offering a widespread strategy to strengthen the women's ability.
- 4- The real political movement of the women must be spontaneous, competitive, organized, group, and based on a suitable ideology and women's movement itself. If the women are political participation performs in terms of other social groups and actually women's political participation. Further, this participation isn't necessarily occurred and enhanced by omitting the legal barriers and gradually social reconstructing.
- 5- It is important for the governments to consider a share and position for the women in governmental posts in its all levels. Although these shares at first may be the high political post such as the member of the general assembly, it is necessary to consider having positions in the middle and low level of the society in order that creating the necessary opportunities for women's organizations and informing its existing potential.
- 6- The educational courses must be held to prepare a background for women so that they can familiar with their rights and self-confidences, in addition can be aware about their individual capabilities and potentials.

- 7- Holding seminars and forming the educational workshops is important to familiarize managers and politicians with sex category and the profits of women's effective presence in the high rank of decision making.
- 8- The managers using women at the high level of the company must be encouraged and promoted to prepare a situation for confirming women's merits.
- 9- The best women should be introduced. Further, their performance must be compared with their similar-rank men.
- 10- The authorities including the president and senate representatives must carry out their election mottos about women.
- 11- The scientific researches about women's problem specially their occupation, management, and their role in the developing of the country.

CONCLUSION

The author of this investigation tried to enquire the principal questions as following:

- 1- Is the women's political participation a social necessity?
- 2- What is the barriers on the way of women's social participation?
- 3- What is the suitable strategies to the women's political participation?

It seems that women is the half parts of the society as an accurate point of view, they exist in all stages of the society such as birth, growth, maturation, and prosperity. In addition, they must do their citizenship duties in the historical areas. Women's the political participation is a social duty in which both women and society involved. The core of the women's political acquaintance requires for the development of the society. Hence, the necessity for reinforcing the women's political participation is not a accidental phenomenon making the social disturbance, but is endogenous that gain the ability of appearance through positive interaction with other effective powers in a society. This revitalized the new historical era. Therefore, women are half of the society, and the social planers must pay attention to utilize their powers to improve the society. The women's political participation is an inevitable necessity without which no development can be made in a society. Social participation is a part of citizenship duties. The authorities are responsible to create a good condition to encourage women to do that. It is essential for a society to employ all human potentials to develop. Thus, the society must pay much attention to the women demand and look for some levels of political participation for them. One of the barriers for women's political participation is that they always obey their husband especially in politics. In their political decision making, the women are not independent and follow their husbands. The other barrier is the conservative political patterns of behavior of the women. According to the many studies about this matter, in all countries, the women support the conservative parties more than men. Further, they are not interested in politics and mostly avoid participating in politics equals to the average interest of the men. In addition, the women's participation in election totally is less than men. They are more ethical toward politics than logical. The politics is considered the following of the personal interests through masculine competition and occupational one. While, the vote of the women is based on moral motivations rather than their interests and ambitions. However, their role in political life cannot be ignored especially present era, the women appeal their demands and follow it. They participate more in the social and politico-economic movement than before.

There are some appropriate strategies to participate of the women in political affairs:

- 1- The basic work of the women's success in current world actually will be occurred by themselves. They must engage in the group forms rather than individually.
- 2- The women's organizations, nongovernment, and popular ones can considerably change the cultural condition and also create the organizational condition to improve the women's political abilities if they work in a concentrate way.
- 3- The United Nation, U.N, plays an important role to do this in a broad range.
- 4- In fact, the real women's political movement must be spontaneous, competitive, group, organized, and also based on the proper ideology of the women's movement. If their political participation is based on the other social group stimulation particularly the men, it won't be real political participation of the women. Further, the resolution of the legal barrier and the gradually social restoration don't necessary cause the improving of women's political participation in political life.
- 5- It is important for the government to consider a share in the all governmental posts for the women at all levels. Although this will be at first about the women's membership in assembly, it must be at the middle or low level of the political posts. The required opportunity to establish the women's institution, body, or organization for being aware of the existing potential is necessary.
- 6- It is essential to hold the educational courses for women to make them familiar with their rights. In addition to prepare the background for women to believe themselves and make them familiar with their individual capabilities.
- 7- Holding the seminars and educational workshops is necessary to make managers and politicians familiar with the sex category the profits of the women's presence I high rank of decision making.
- 8- The managers who utilize the women at the high level of their organization must be encouraged I order to require the required opportunity for confirming their abilities.

- 9- Introducing the best women and comparing their performance with their same. Ranke men are good.
- 10- The authorities including president and assembly member must carry out their election mottos about women.
- 11- The scientific investigations bout women's occupation, management, and their role In developing the country must be done.

The point of view of Islam about above issues is as following:

Islam not only agrees with the women's political participation but also is one of the founders of that view. Motahari, told "the Islamic society and republic won't be durable without the women's participation".[15]

CONFLICT OF INTEREST

There is no conflict of interest.

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REFERENCES

1. Abercrombie, Ni. , Hill, S., & Turner, B.S., (1945). The Penguin Dictionary of Sociology (Penguin Dictionary), London: Penguin Group, p.327
2. Ferrero, Guglielmo, (1942). Pouvoir: Les genres invisibles la cite, new Yourk: Brentano's, p.214
3. Outlook socio-political participation of women, (2007). MardomSalary Site, No.1644, <http://www.bashgah.net/fa/content/show/45704>
4. De Gouges ,Olympe, (1791). Declaration of the Rights of Woman and the Female Citizen,. Retrieved (2015-11-30). www.olympedegouges.eu
5. Crindle, MC. (1975), women's history in radical philosophy, No.10, p.41
6. Ravandi, M., (2003). Iran social history, Tehran: Negah (3rd V.), p.191
7. World Economic Forum, (2014). www.weforum.org
8. Haunt, S. (2007). the role of the women in the government, translator: Mehrizi, M., A., East newspaper, No.920th.
9. IOE Celebrates International Women's Day, (March 8, 2016). www.uscib.org/ioe-celebrates-international-womens-day/
10. Bashiriyeh, H. (1995). political sociology, Tehran, Nei press, p.292
11. Sangterash, L. (2007). the cultural Barriers for women's political participation. Democracy, No. 160st.
12. Javadi Amoli, A., (1999). Woman in the Mirror of the Beauty and Glory, Qom: Asra Pres, p.241
13. Bo Torabi, Khadijeh, (2011). Shia Encyclopedia, Yehran: Mohebi Press, 8:492
14. Iran Economic Magazine (2005). Political woman, No.77.
15. Motahari, M. (1978). the woman's right system, Qom, Sadra press.

ARTICLE

CONSIDERING THE ROLE OF CLIMATIC COMFORT AT TOURISM ATTRACTION IN MOUNTAINOUS REGION (CASE STUDY: MASAL HEIGHT FROM RAMINEH TO OLESBLANGAH)

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ABSTRACT

Masal city from cities of Guilan province new with primary natural structure and with human structure is severely developing that its natural texture has been saved with variety of vegetation and forest and animal. This city is consisting of three sections of plain, foothill and mountain. The most important capability and ecotouristic power of Masal is existence of mountains and old forest famous to Hirkani forest with favorable climate, river, wild life and variety of plant and animal species and caves. Research method in this research is descriptive-analytic and method of data collection is library-field that in field information section questionnaire of tourist, interview of local society and field visit of countryside of studying area was used. Based on index of human comfort effective temperature and *olegi* in research studying region had favorable condition in June, July, AUG, Sep, Oct and regarding weather condition of countryside and decreasing temperature in height necessary condition for entering tourist was provided in these regions. In the research regarding importance of tourism and because climate is a natural environment factor it has important role at development of tourism industry in different regions of the world it was concluded that climatic comfort can be effective factor at tourism attraction in summer and height with decrease of temperature has effective factor at tourism attraction.

INTRODUCTION

Forest and mountains are the most beautiful lyrics of the great creator of art. Coordinated movement of branches of trees of beech, oak, maple and ... in prayer and spiritual quantum takes intelligent human to the God. Old forest and magnificent pasture and countryside, plant and animal variety has brilliant view for development of tourism industry and ecotourism at the province and country. Nowadays tourism as a dynamic and comprehensive industry encompasses all existential basis of a society and global systems. Development of tourism industry as part of dimension of social and cultural development of any country beside attention to making income and employment is important [1]. Tourism movement is a kind of valuable exchanging free trade that is consist of different geographical atmospheres as origin, direction destination and places for organizing tourism services (fourth dimension). In the era of post-modernism the earth from bottom of ocean to the atmosphere and all humanity and cultural and natural features and artistic works consist tourism atmosphere [2]. Tourism as an important economic section of the world shows significant sensitivity toward weather. Weather plays strong effect on tourism and amusement, as in some regions of the world prediction of tourism situation is done based on weather. Weather as transmitted condition of climate and climate as dominated weather of a region [3] are natural environment factors that in many business, agricultural activities and mostly in tourism were dominating factors and economic output of these activities depends on climate directly [4]. Weather accompanied by geographical situation, topography, viewpoint, flor and foun, consist basis of natural resources for tourism and recreation [5].

MATERIAL AND METHODS

Method of data collection

Method of data collection is based on field observation-using map- questionnaire-documents and statistical analysis and working method in research is in descriptive and analytic with applied goals based on field observation and method of data analysis is by using GIS and SPSS software.

Materials

Climatic and informational data related to resources of water in the region and tourism data and questionnaire in this research have been used, statistics of data of meteorology were collected regarding lack of existence of synoptic station in Masal city from summary of statistics of evaporation of company of regional water in Guilan situated in river of Taskooh in Masal and data related to tourism was collected from tourism organization of the province and natural resources, books and university notes and for analyzing climatic appearance of the regions parameters like: temperature, rain, humidity and radiation were assessed.

KEY WORDS

tourism, mountain,
climatic comfort, Masal

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Studying area

In this research height of masal, case study of countryside of Ramineh to Olesblangah have been considered that by having favorable condition regarding climatic comfort especially in warm seasons of the year and ways of proper access is attracting tourist.

Masal city is located at the west of Guilan province and at the area of 37° and 15min to 37° and 29 min of north and length of 48° and 43 min to 49° and 11 min of east. Masal from the north is limited to Rezvanshahr, from northeast and east and southeast to Somesara, from south to Fouman city and from southwest and west to Khalkhal and Ardabil province. Area of city is 622/5km² and its center is Masal city. Masal city has two central sections including surrounding villages and Masal and Shanderman section includes villages of Sheihneshtin and Shanderman, and two cities (Masal and Shanderman) and has 98 villages that 78 ones have more than 20 families. Number of residential villages of the city consist 3.6% of residential villages of the whole province and villages having 20 families and more consist 3.8% of villages above 20 families. Rural dimension of city was high as rural population of the whole city was 33096 people that are twice of its urban population. Central section of Masal has 42 villages and Shanderman section has 56 villages.



Fig.1: Situation of Masal city in Guilan.

Table 1: Features of countryside at studying region

Natural situation	Distance of the section (km)	Height (m)	Longitude	Altitude	Name of region	Name of countryside	Row
Forest situated in mountain	24.5	650	322161	4131918	Central section	Ramineh	1
Forest situated in mountain	25.5	1150	321521	4130825	Central section	Aridvel	2
Mountainous	28.5	1400	319088	4129415	Central section	Telargah	3
mountainous	28	1500	319158	4129926	Central section	Olesblangah	4

weather

Masal city has humid temperature climate that n height over 2000m is changed to cold mild. Average temperature of the region along year is fluctuation between 7.2 to 27 °c. Average maximum temperature is 11.3 to 32.4 °c and average minimum is 2.7 to 21.7°c. Number of glacial days has estimated 19 days a year averagely. Number of rainy days in the year is 100 days and degree of rain is 1051mm. relative humidity of this city is fluctuating between 67-82%. The whole climatic condition and topographic condition of the city has three plain, foothill and mountainous sections and neighboring Caspian sea and climatology wall of Talesh has changed this city to a countryside region having good weather. Existence of relatively populated forest, pasture in upper sides, domain villages, permanent rivers and fountains and enriched agriculture can be known as effect of favorable condition of Masal city. Plan section of Masal city is located in very humid regions. Average annual rain is 1010mm and average annual relative humidity is 81% due to existence of much steam the weather has mild temperature with short fluctuation daily and during the year. Average annual temperature is 16°c and average minimums and maximums of temperature has become 10.6 and 21.2°c. Studies show that region has mild humid weather and has much climate falls and as we go toward south from the north by increase of height of temperature, relative humidity of changes of temperature and degree of rain is decreased. Glacial happens rarely however the probability of occurrence of humid situation is much.

Regarding agriculture plain and foothill section of the region has a dry season and its severity is low that continues from middle of june to the end of july. Also it lacks very cold season and only four month has cold and moderate weather. Since april to the end of sep the degree of evaporation is more than raining that increases since june. Oct, Nov, Dec is the months that raining is more than evaporation to much degree and is saved in soil to much extent.

Human comfort through effective temperature method or ET in Masal

Much attempt have been done for designing index that affect human temperature comfort in these index it has been tried to present effect of humidity and temperature of environment. These indexes are used in global and local scale method of effective temperature is the index of temperature comfort are the action have been used more than other indexes.

Effective temperature formula: $ET = t - \{ 0.6 (t - 10) (1 - RH / 100) \}$

RH: relative humidity

T: temperature

EF: effective temperature

Then based on result formula of the following talbe has been set.

Effective temperature method: ET(temperature and humidity)

Table 2: Effective temperature method

ET	Temperature coefficient
> 30	Extremely warm
27.5-30	Humid
25.6 - 27.5	Very warm
22.2 - 25.6	Warm
17.8 – 22.2	Comfort
15.5 – 17.8	Cool
-1.67 – 15.5	Very cool
-10 - (-1.67)	Cold
(-20) – (-10)	Very clod
< -20	Extremely cold

Result of formula and [Table 2] adapt wit this quote of Elsort Hantington the algebra oriented climatologist who says “the best temperature for human environment is while average limit of day and night temperature is between 15.5 to 21°c but he also believes that advent of old civilization of Egypt, Iran, Room and main civilizations are seen during periods before history that average annual temperature was between 18-21°c or near to this limit. The best climatic condition for human is that a person without much attempt can make reasonable balance between warmness of body and lost warmness that is don't receive any temperature from outside and don't give temperature to the environment, therefore cold and warm weather isn't proper for life, the least metabolism is done in 18-25°c and less or more that this limit will lead to metabolism [6].

Table3: Effective temperature method of Masal

Month	T	RH	$ET = t - \{ 0.6 (t - 10) (1 - RH / 100) \}$	Temperature coefficient
Oct	20.9	82	19.7	Comfort
Nov	15.6	81	14.9	Very cool
Dec	10.4	80	10.3	Very cool
Jan	7.3	81	7.6	Very cool
Feb	7.2	81	7.5	Very cool
March	9.1	80	9.2	Very cool
April	12.3	78	11.9	Very cool
May	17	78	16	cool
June	23.3	71	20.9	comfort
July	25.9	75	23.5	warm
Aug	27	67	23.6	warm
sep	24	75	21.9	comfort

Based on above method humanity comfort in June, Sep and Oct is completely favorable and regarding decrease of temperature in height of the region July and Aug can be placed in comfort condition and are stated as semi-favorable. It is necessary to mention that other month is unfavorable for human comfort.

Human comfort through olgi method in Masal

Based on used methods it seems that in our country any experiment and research that distinguishes favorable condition of weather regarding temperature and humidity hasn't been done so for determining limit of comfort region in Iran suggestive method of Olgi has been used, Olgi has suggested temperature 70-80°F (1.1-27.8°C) for summer and 68-76°F (20°C) for winter and relative humidity of 30-65% as the favorable condition of weather. Of course this limitation has been suggested for mild regions of America with height less than 1000 foot (330m) from sea surface and for people who have activity in sitting condition and wear usual cloth in the house has been suggested. In his opinion these tables can be used by changes in other regions and for each 5 degree of reducing geographical altitude toward 40 degree of north it increased summer comfort about 3.4°F at the bottom of region but this limit shouldn't exceed 85°F. Therefore we can place limit of comfort region for Iran between 25-40 degree of altitude regarding temperature in summer between 1.5 to 9 and in winter between 20-7.5°C, range of relative humidity in these two seasons is supposed between 30-65%. Of course we can't determine exact limit for comfort region due to favorable temperature for weather in different regions because favorable temperature of weather in a distinct region for people with different ages differs it depends on the degree of activity and type of cloth of people [6].

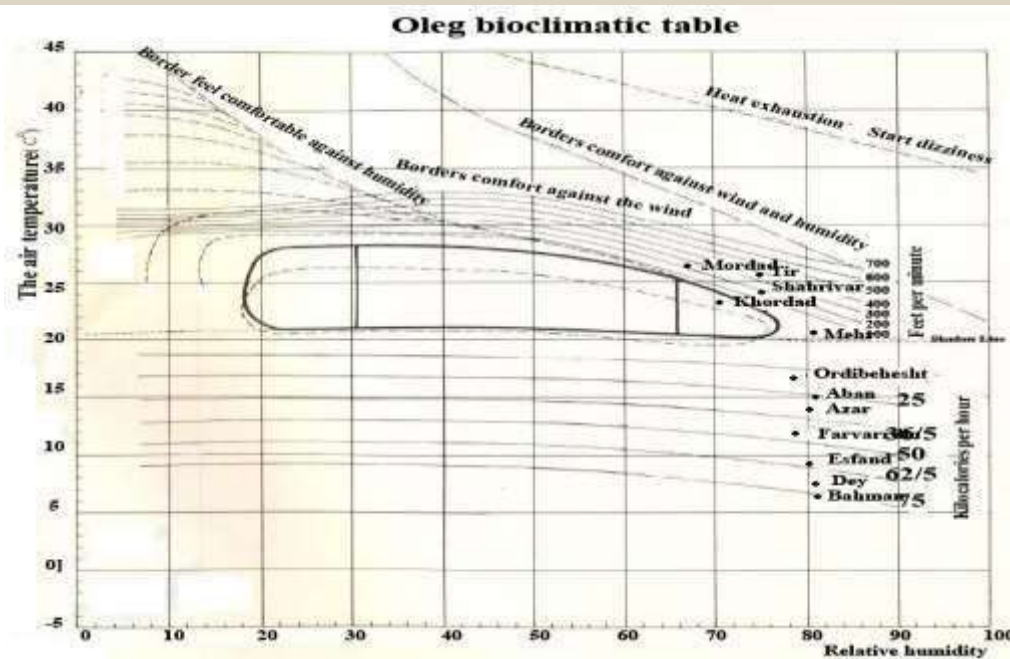


Fig. 2: Bioclimatic olgi of Masal city.

Based on this method human comfort was favorable in June and regarding especial condition of weather of countryside's and decrease of temperature in heights of region in month July, Aug, Sep and Oct there is climatology comfort condition and is semi-favorable. In other month condition of temperature and humidity is unfavorable for human comfort.

Questionnaire result

1-existence of forest and good weather condition and its effect on tourist attraction of the region
 Attractiveness of forest of Masal and Shanderman is in variety of tree and vegetation species of forest lands. Mixture of three factors of favorable climate, river and pasture in these forests has created beautiful combination of the kinds of natural colors and viewpoints. However lack of access to these natural mixtures is lack of ways and the main condition of connection of forest with activities of tourism is development of ways that passes forest regions. Forest with all natural features and ecologies in the world beside economic values has especial importance regarding tourism and recreation. Respondent to identified questionnaires in this case has claimed their opinion as below:

Table 4: Degree of effect of height at decreasing temperature and existence of forest at tourism attraction

Total		Low		Much		Extreme		Explanation	Raw
Percent	Number	Percent	Number	Percent	Number	Percent	Number		
100	374	2.1	8	33.3	125	64.6	241	respondent	1
100	374	2.1	8	33.3	125	64.6	241	sum	

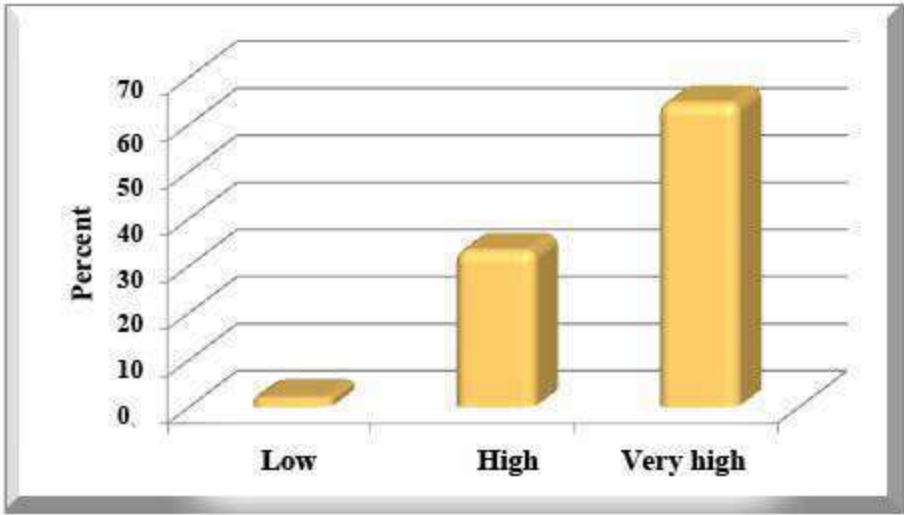


Fig. 3: Degree of effect of the factor of height n decreasing temperature and existence of forest at tourism attraction.

Mountains and countryside

Countryside of the city has been consisting of three sections regarding natural viewpoint. Forest countryside that is used more by nomadic farmers. Countryside's situated at the border between forest and pasture that were used temporary and countryside situating in height and ridge of mountains that are used by nomadic farmers. Mountains and countryside of Olesblangah are counted as the most beautiful weather of visiting regions.

Table 5: Degree of existence of good weather of countryside at tourism attraction

Total		Total		Low		Much		Extreme		Explanation	Raw
percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number		
100	374	2.1	7	4.2	16	31.2	117	62.5	234	respondents	1
100	374	2.1	7	4.2	16	31.2	117	62.5	234	sum	

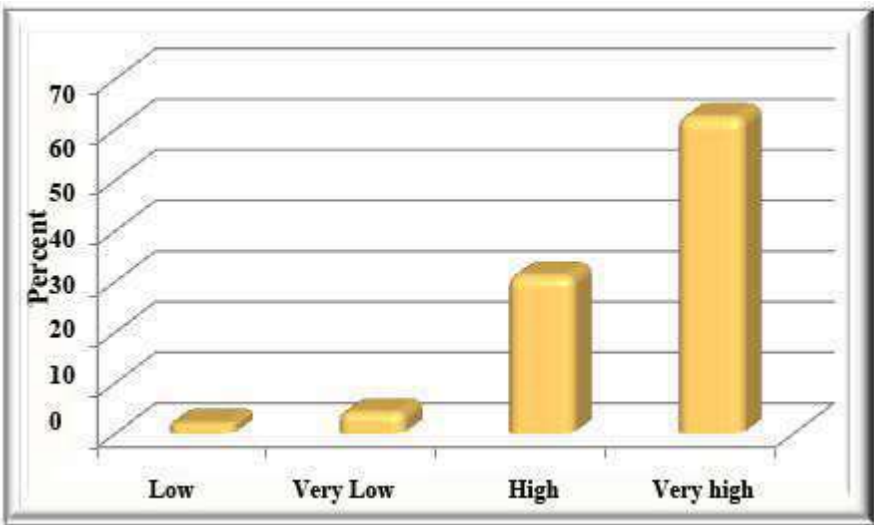


Fig. 4: Degree of effect of good weather of countryside in tourist attraction.

Winter tourism in Gilan

Lands that have good mountainous situation can create ideal situation for winter tourism by making specific strategies, Masal countryside region and cold heights of the regions in winter provide possibility of doing winter exercises and can cause promotion of tourism regarding different factors.

Table 6: Degree of effect of providing facilities of winter sport at tourist attraction

Total		Not climed		Not at all		Very low		Low		Much		Extreme		Explan ation	Raw
Perc ent	Num ber	Perc ent	Nu mbr	Perc ent	Num ber	Perc ent	Num ber	Perc ent	Num ber	Perc ent	Num ber	Perc ent	Num ber		
100	374	4.2	15	4.2	15	2.1	8	22.4	86	39.6	148	27.1	102	respon dent	1
100	374	4.2	15	4.2	15	2.1	8	22.4	86	39.6	148	27.1	102	sum	

Fig5: degree of effect of providing possibility of winter sport at tourism attraction

Table 7: table of distribution of percent of goals of respondent about travelling to the region

Total		Not claimed		All cases		Proper weather/spo rt		Natural viewpoints/w eather		Weather		Nature		Explan ation	Raw
perc ent	numb er	perce nt	Num ber	Perc ent	Num ber	Perc ent	Num ber	Perc ent	Num ber	Perc ent	num ber	perc ent	Num ber		
100	374	2.1	8	8.3	41	2.1	8	10.4	49	31.2	117	45.8	171	respon dents	1
100	374	2.1	8	8.3	41	2.1	8	10.4	49	31.2	117	45.8	171	sum	

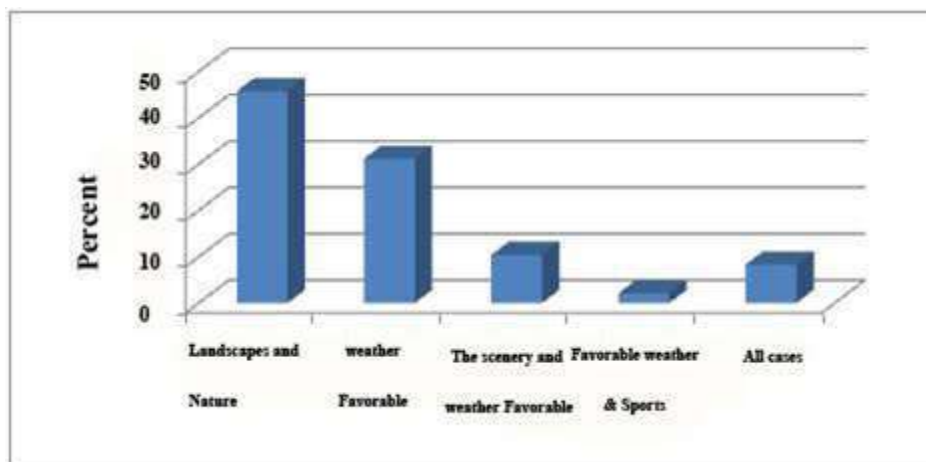


Fig. 5: Distribution of percent of goals of respondent about travel to the region.

sig 95%

Table 8: Tested variables at X2 test for first hypothesis

Rejected or approved	H_1	H_0	df	choices					Statistic χ^2	variables	raw
				Not at all	Very low	Low	Much	Extrem e			
*	✓		3	-	7	16	117	234	1.385	good weather and coolness of these region to urban points warmness of weather and high humidity at warm seasons causes tourism attraction existence of favorable weather and unique regions at thinking and mental comfort	
*	✓		4	8	8	8	132	218	1.923		
*	✓		4	-	8	8	101	257	1.710		

H₀: climatic comfort can be effective factor at tourism attraction (there is relationship between climatic comfort and tourism attraction).

H₁: climatic comfort can't be effective factors at tourism attraction (there isn't relationship between climatic comfort and tourism attraction) Sig at 95%

Table 9: Tested variables at X2 test for second hypothesis

Rejected proved H_1	or H_0	df	Choices					Statistic X^2	variables
			Not at all	Very low	Low	Much	Extreme		
x	✓	2	-	-	8	125	241	84.37	effectiveness of height at decreasing temperature and existence of forest at tourist attraction
x	✓	4	15	8	86	148	102	75.91	providing winter sport facilities at tourist attraction
x	✓	3	-	8	8	163	195	1.230	existence of countryside at tourist attraction

H₀= the factor of height is effective at tourism attraction with temperature decrease

H₁= factor of height isn't effective at tourism attraction with decrease of height.

CONCLUSION

Attraction and tourism capabilities of Masala ns Shanderman is dispersed in its geographical dimension this city that is consist of three plan, foothill and mountainous sections each has especial attraction for tourist that the most important one is natural attraction that in recent years has been paid attention by travelers. The most important capability and Eco touristic power of Masal and Shanderman is existence of mountains and old forest famous to Hirkani forest with favorable climate, rivers, wild life and variety of vegetation and animal specious and caves. Existence of god weather as the most important physical parameters plays significant role at planning of recreation and tourism. By identification of these environmental capabilities we can provide the field for tourism development and attract many tourist at national and transnational levels to this city. Climatology of tourism as a applied branch of meteorology in recent years has achieve considerable promotions about searching capability and climatic power of touristic regions. In this direction and based on obtained index in this research human comfort of studying regions was favorable in june, july, Aug sep and oct and regarding weather condition of countryside and decrease of temperature in height of the region necessary conditions is provided for enter of tourism into these regions. However existence of all natural and historical and cultural attractions of Masal couldn't be successful at attraction and development of tourism that this action is due to lack of infrastructural constructional factors in this city that in the research and by using people's viewpoint was done. Because olesblangah and Masal regarding natural attraction(ecotouristic) is one unchanging region of the province and even country and by proper planning and by creating installations and infrastructural equipment's we can promote tourism industry in the city and people of the region observe positive effect of tourism in their personal and social life.

SUGGESTIONS

By seeming environmental barriers and capabilities of countryside of the region the following suggestions is identified as below:

- modifying infrastructural foundation like road improvement-transportation-welfare facilities such as increasing recreation facilities and making hygiene services
- attraction of organizations and public organizations like organization of preserving environment, natural resources, organization of cultural heritage and tourism and for management and optimized use of region
- empowering local niceties
- advertisement and supplying informational brochure for informing tourism
- equipping and creating long barbecues in countryside of the region and renting them to tourist for cooking prevent making fire at the forest and countryside
- providing plays and winter sport
- investment in natural attraction including caves and natural fridges and waterfall

CONFLICT OF INTEREST

There is no conflict of interest.

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REFERENCES

- [1] Mohammadi rasoul, Feizi, Vahi(2008), studying climatic condition of Esfahan for developing tourism by using TCI method
- [2] papeli, Mohammad Hassan, aghaei, Mehdi(2006), tourism(nature and concepts) Tehran- semat publication
- [3] Ebrahimi, Nase(2005) climatology assessment for tourism in Sardasht city, M.A thesis of climatology, Tehran university
- [4] Kaviani, Mhammadreza and Bohlol Alijani(2003), principles of metrology, semat press
- [5] Zolfaghari, Hassan(2010) tourism meterology, semat publication
- [6] Mohammadi, Hossein(2006), applied meterolgy, publication of Tehran university
- [7] Abolhasani, Bijan(2004) climatic capabilities and limitation of tourism attraction in Ramsar and Tonkabon city, M.A thesis of natural geography, Tehran university
- [8] Azizi Shalkeh, Soleiman , introducing natural attraction of Masal and Sahnderman, Internet
- [9] Bazrparast, Hamid,Hamid(2004). Thesis of ecotourism of Ghale rood khan valley regarding limatic capabilities and limitation
- [10] comperative consideration of political-geographical divisions of Guilan province, 1977-2003, organization of deputy of planning in Guilan governing office
- [11] consulting engineers of green spectrum, 2006, qualitative and quantitative studies of Guilan province
- [12] De Freitas C.R (2003) , Tourism climatology : Evaluating environmental information for decision making business planning in the recreation and tourism sector
- [13] Eslah Arabani, Guilan book, sixth volume
- [14] explanatroy result of general census of Housing of Masal, 2006
- [15] general census of houses, 2006, culture of constructions of country Masal city, statistic center of Iran
- [16] Ghadiri, Zeynab(2012) geographical analysis of Shaft city and its rloe at tourism development, M.a thesis at Islamic Azad university of Rasht
- [17] Hafeznia, mohammadreza (2004 introduction of research method in human sciece, semat publication
- [18] Heidari, F(2008) application of index of PET and PMV in determining time calendr of tourism in southern coast of Iran, M.A thesis of geography of Razi univvrstiy in Kermanshah
- [19] Iran rivers, Yadoolah Afshin, ministry of force, consulting enginners of Jamab, 1994, second volume
- [20] Iran's geographical culture, office of geography of army committee, second volume, first province, 1949
- [21] Jacqueline , Hamilton , maddison , Richars.j.tol (2004) climate and the Destination choise of german tourists
- [22] Jinyang deng , Berianking , Thomas bauer (2002) , Evalutiong natural Attractions for tourism
- [23] Khaledi, Shahriar(1995), applied meterology, publication of Ghomes university, Tehran
- [24] M. BLen Gomez martin (2005) , weather , climate and tourism a Geography perspective , annals of tourism research
- [25] Mahmoodi, Peyman, 2008, tourism paper and determining limitation of climatic comfort in Marivan city
- [26] map of construction of Guilan province, organization of management and planning of Mohammadi, ranjbar, Mohammadjani, Hashemi (2008), analytic paper on relationship of climate and tourism
- [27] Guilan province, rasht 2004
- [28] Moradi joker, Ayob, Ramzanzadeh Lasbouei, Mahdi, global viewpoint about opportunities and its rocessing challenges
- [29] Olesbelangah tourism plan, 2010, office of environment at Masal
- [30] Omid chenari, Salar(2010) paper of identifying ecotouristic potential of bioclimatic comfort of Chobar village in Shaft
- [31] Rajabi, Saeid(2010) ecotorism of Taram city regarding capabilited and climatic limitation, M.A thesis at Islamic azad university of rasht
- [32] regional information of Guilan province, first volume, existing posibilites and instalations in Guilans' countrysides, organization of planning and budget in Guilan, GIS unit, journal No 138
- [33] regional information of Guilan province, second volume, population featur and educational facilities of Guilan countrysides based on the latest country division, organization of plan and budget in Guilan, GIS unit, journal No 158
- [34] Rezvani, Aliasghar(1990) geography and industry of tourism, publication of Payam e Noor university
- [35] Sari Saraf, jalali, Kamali Azin(2010), zoning of climatourismm of Arasbaran region by using index of TCI
- [36] Shahbazi, F, 2007, considering condition of tepreture comfort in northern coast of Iran, M.A thesis of Geography group at Razi university in Kermanshah
- [37] Shakourian, Shahrooz(2011), considering geographical situation of Astara at tourism attraction by using SWOT model, M.A thesis at Islamic azad university of Rasht
- [38] Sharpli, jolia, 2001, rural tourism, translated by Monshizadeh and Nasiri, Monshi press
- [39] statistical reports of rural ways of Guilan province, office of transportation at Guilan province, Rasht
- [40] system of electronic services of Masal, Internet
- [41] Taghvaei, Masoud(2009) role and position of multi-dimensional planning in tourism and ecotourism development, journal of geography and environmental planning, No 35
- [42] Yaghoobi Chobari, Ali(2007), writing of eople of Masal city
- [43] zolfaghari,H(2010) analytic paper of climate potential of tourism in Aras free region

ARTICLE

TECHNICAL AND ECONOMIC ASPECTS OF THE MANUFACTURING OF INDUSTRIAL STRUCTURES CASE STUDY WITH THE AIM OF IMPROVING AND UPGRADING THE PRODUCTION PROCESS

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ABSTRACT

Due to the sensitivity of competition in the industry to offer a qualitative and consumer-oriented product as well as to access to a high-quality product with the lowest cost, the present research investigates the community needs and the encouragement of consumer to buy the product in terms of quantitative and qualitative aspects. Today, the use of and need for human resources for manufacturing lines require high costs, and result in low quality product. As a result, in this study we decided to provide strategies to improve the quality of product and to optimize the costs using mechanized production lines instead of human resources or the employment of minimum human force. Therefore, the objective of the present study was to investigate the factors influencing on manufacturing industrial structures (warehouse). The data were collected through the distribution of the researcher-made questionnaire (a questionnaire in 3 sections with 27 items) in 11 factories in 2015. The sample size was determined as 86 individuals according to Cochran formula. Analysis of the data by SPSS software indicates the effectiveness of all three factors of innovation, cost and time, and the quality in manufacturing of industrial structures. After the primary pre-processing, it was found that all three factors of innovation, cost and time, and the quality were effective in manufacturing industrial structures. According to results of Friedman test, we found that the factors of cost and time have the greatest impact on manufacturing of industrial structures and the quality factor has the minimal impact.

INTRODUCTION

Along with the progress of industry and technology, the needs for the various and single-purpose devices and equipments increase day by day. In addition to these variations, the various tastes of users and process of industry evolution have caused that the other old systems of production such as the difficult manufacturing line and automation are not responsible for permanent changes in market demands. As a result, by narrowing the competition field, in recent years the manufacturers have applied custom manufacturing systems, flexible manufacturing systems and soft automation to be able to satisfy of the needs of their customers and to guarantee their survival [1]. During the change and evolution of these manufacturing systems, computers have very important role in the conduct, control and follow the various manual or mechanical operations. On the other hand, to reduce human error and improve the level of reproducibility and accuracy, various robot have been designed and manufactured in order the manufactured products have higher quality and reliability [2].

Today, the use of and need for human resources for manufacturing lines require high costs, and result in low quality product [3]. As a result, in this study we decided to provide strategies to improve the quality of product and to optimize the costs using mechanized production lines instead of human resources or the employment of minimum human force.

Due to the sensitivity of competition in the industry to offer a qualitative and consumer-oriented product as well as to access to a high-quality product with the lowest cost, the present research investigates the community needs and the encouragement of consumer to buy the product in terms of quantitative and qualitative aspects [4].

In the context of the country's industrialization and forward movement of industries to achieve progress, paying attention to the needs of society and existing potentials, as well as the use of resources and materials available in Iran are of special importance.

According to the situation of Iran in terms of resources and materials available, as well as the growing industry of the country in recent years, the appropriate potentials exist for progress and competition with similar foreign industries.

In the present study, by investigating the role of quality in industrial products and doing interview and reviewing of previous studies about factories making metal skeleton, we try to identify the important factors in the designing and manufacturing industrial structures and then rank them using statistical methods.

MATERIALS AND METHODS

Since the researcher is going to use the results of the study in the short term and in the operation field (firm), therefore, the present study is an applied one in terms of its objective. It is also a survey in terms of its trajectory, in which the variables of the research are studied through a process comprising the decision-making steps on the subject, question or hypothesis or research, selection of the studied population and sample size, the determination of parameters and methods of data collection, and organization and analysis of data. Also,

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this research is a case study in terms of data collection, which includes collecting data or new information from the subjects by methods such as observation, questionnaires, and interviews and so on. In the present study, the study population consists of 110 individuals (all experts working in the factories manufacturing metal skeleton in Iran). According to the variance obtained through pretest and the use of Cochran's formula ($n = \frac{N \cdot Z_{\alpha/2}^2 \cdot S_x^2}{e^2 \cdot N - e^2 + (Z_{\alpha/2}^2 \cdot S_x^2)}$), the sample size was estimated equal to 86 individuals. The subjects were selected through stratified cluster sampling method. To determine the validity of the measurement tool in this study, the content and face validity were used. In the present research like many other studies, to assess the reliability of the instrument, Cronbach's alpha was used [Table 1]. Cronbach's alpha coefficient is a number between zero and one. Alpha coefficients less than 0.6 indicate poor reliability. Alpha coefficients higher than 0.7 to 0.8 indicate relatively good reliability, and alpha coefficients higher than 0.8 indicate high reliability of measurement tool [5].

Table 1: Cronbach's alpha of variables

Variables	Alpha coefficient
Innovation	0.761
Cost and time	0.859
Quality	0.877
Total	0.901
Test result	Considering that the calculated Cronbach's alpha is higher than 0.70, it can be concluded that the null hypothesis is confirmed which means that the validity of the distributed questionnaire is good.

Collection of data

Data collection took place over several days and the researcher visited the studied firms and distributed the questionnaires and at the end of the day collected them, then the acceptable and valid questionnaires of each firm were categorized. The respondents were not forced to complete the forms and completion was carried out willingly and without any pressure in the allocated time. In the process, if it was observed that one participant completes the form haphazardly or with low accuracy, or in inappropriate conditions (in any form), that form would be deleted. In the process of distributing questionnaires and collecting data, accuracy and effort were applied and the activities such as the presence beside the respondent and frequent referent to him/her, as well as providing positive and useful explanations to demystify the probable ambiguities and increasing the respondent's tendency to complete the form and answer all questions correctly increased the accuracy and precision of the collected forms. However, in spite of all these actions, 90 questionnaires were distributed that very few of them were not returned and many more due to reasons such as incompleteness, failure to respond fully to the questions or flawed and invalid answers were not usable.

Solving method

In data analysis section, both descriptive statistics and inferential statistics (t-test and Friedman's test or symbols) must be used. In this study, data analysis is done in two parts, such that in the first part we study each of hypotheses which indicate the effectiveness of factor on the manufacturing of industrial structures. Then, using the confirmed hypotheses, each factor is ranked such that in the case of being parametrical the data, the t-test is used; otherwise, to show the variables to be important the sign test is used and to rank the variables Friedman's non-parametric test is used. Also, to study the normality of data, Shapiro-Wilk test is applied.

RESULTS

The first part of the questionnaire is related to demographic characteristics of respondents, including the education, fields of study, job title, experience and name of the factory where they work. Of 84 respondents, 10.7% had diploma, 14.3% associate diploma, 44% bachelors, 25% masters of art/science, and 6% had doctorate degree. Respondents were divided in five groups according to their fields of education majors, in a way that 54.8 percent of respondents were Civil engineering, 21.4% were Mechanic engineering, 2.4% were metallurgical and materials engineering, 6% had studied in Management course (all branches and sub-fields), and 15.4% had studied in other fields and majors.

To answer the hypothesis, the average scores related to questions (items) were used. Each item in the questionnaire was given a score between 1 and 5, so, according to statistical tests related to the hypotheses, the type of impact and its significance rate is determined by average scores; and finally if the error probability (P-value) is less than 0.05, it will mean that the hypothesis is confirmed, or statistically, we have:

The answer to research hypothesis is negative: $H_0: \mu = 3$

The answer to research hypothesis is positive: $H_1: \mu \neq 3$

To determine the type of test used, especially in the benchmarks (comparative tests), it is necessary to ensure the normality of variables [Table 2]. If the variables are normal, the use of parametric tests is recommended, and otherwise the non-parametric tests will be used.

Table 2: Results of Shapiro-Wilk Test in the studied variables

Factors	Shapiro-Wilk test	The significance level	Result
Innovation	0.908	0.206	Normal
Cost and time	0.971	0.053	Normal
Quality	0.972	0.064	Normal

The single-sample t-test is used to test the hypothesis about the population mean. In most of the studies that are done with Likert scale, this test is used to study the hypotheses and to analyze the technical questions related to them. Next, due to normality of variables, t-test was used to evaluate the presence or absence of the influence of the variables [Table 3].

Table 3. Results of student t-test

Variable	Degrees of freedom	student t-test	P-value
Innovation	83	20.320	0.000
Cost and time	83	28.106	0.000
Quality	83	13.369	0.000

According to the significant level of 0.05 and p-value, we conclude that the variables of innovation, cost and time, and quality are effective in the results; and according to being positive the result of t-test it is determined that the importance of innovation is very high.

Finally, in order to rank the results, Friedman test is used [Table 4].

Table 4: The results of Friedman test

Sample size	Chi-square statistic	Degrees of freedom	Significance level
84	50.425	2	0.000

According to the obtained significant level of 0.000, due to being lower than research significance level (0.05), it is clear that the effectiveness of the determined factors in the goal of study is not equal. Then, the effect of each factor is determined according to its rank such that a factor with lower rank has higher impact and vice versa (the factor with rank 1 has the highest impact) [Table 5].

Table 5. Ranking the factors effective in manufacturing industrial structures

Variable	Average ranking	Rank
Innovation	1.98	2
Cost and time	2.56	1
Quality	1.46	3

[Table 5] indicates that the variable of cost and time has the highest impact on manufacturing industrial structures, and the quality variable has the lowest impact.

CONCLUSION

According to what was said, the general objective of this study was to investigate the factors influencing the manufacturing industrial structures (warehouses). At first in order to make reader familiar with the issue, an introduction has been mentioned about the statement of the problem, and then the research methods and data collection methods were fully discussed. Finally, the results of data analysis were fully discussed and studied using SPSS software in both descriptive and inferential statistics.

In order to provide an answer to the main question of this study, some specific sub-questions were designed that by answering them the hypotheses of this study were tested and evaluated. In other words, based on the survey conducted, 11 factories were identified (Omran Sanat, Parag Sazeh, Sazvar Sazeh Azarestan, Roof Terrace, Folad Sanat Sazeh, Soliran, Kariran Soleh, Boniad Soleh, Omran Soleh, Rokn Soleh and Copal Company) that by using the ideas of line supervisors, experts of technical office, and experts of manufacturing line, the managers of manufacturing, the managers of the factories, etc. the questionnaire were completed. The results of this research were obtained by designing a questionnaire in three sections with 27 items. In this study, the effects of three factors of innovation, cost and time, and quality on manufacturing industrial structures (warehouses) were investigated. After primary pre-processing, it was found that all three factors, i.e., innovation, cost and time, and quality were effective on manufacturing industrial structures. Also, these factors were ranked in this study according to their effects. The main focus of this research was to provide useful strategies for the factories manufacturing industrial structures correctly by identifying the effective factors on this industry.

SUGGESTIONS

In this regard, the following researches are suggested to be carried out to develop concepts related to the manufacturing of the industrial structures (warehouses):

- Presentation of catalog for manufacturing industrial structures to provide the costumers' needs
- Product diversity in the systems of mechanized production
- Creating the culture of using industrial resources and saving the materials
- The use of rolled systems for constructing sections instead of welding and assembling
- Paying attention to human resources specialized in providing qualitative products
- Using shop maps in order to minimize the waste materials
- Paying attention to the repair and maintenance of automated production lines
- Providing periodic training courses to gain skills for welding and assembling segments and working with equipments
- The final control of assembled parts to prevent probable errors and mistakes
- The use of robots for assembling and manufacturing the parts
- Use of professional design and shop engineers
- Reduplication of the present study for similar products
- If future researchers repeat the present study in other geographical areas, not only more results will be achieved but also the generalization of results will be much more.

CONFLICT OF INTEREST

There is no conflict of interest.

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REFERENCES

- [1] Klei T, et al.[1991] Proximity of a metal-insulator transition in icosahedral phases of high structural quality. Physical review letters, 66(22): 2907.
- [2] Hashimoto T, et al.[2007] A GaN bulk crystal with improved structural quality grown by the ammonothermal method. Nature materials, 6(8): 568-571.
- [3] Lee K. et al. [2012] Computed tomographic evaluation of gas hole formation and structural quality in Gouda-type cheese. International journal of dairy technology. 65(2): 232-236.
- [4] Curtis B, J Sappidi, J Subramanyam.[2011] Measuring the Structural Quality of Business Applications. in AGILE..
- [5] Fowler Jr FJ. [2013]Survey research methods. Sage publications.

ARTICLE

DETERMINING THE OPTIMAL POINT OF PURCHASE INTENTION: USING GENETIC ALGORITHM EVIDENCE FROM IRAN KHODRO AUTO INDUSTRY

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ABSTRACT

The increasing importance of brand management in turbulent competitive world of national and international markets requires further efforts in the field of marketing research. This paper follows two basic purposes: First, to explore the relationship between the dependent variable "purchase intention" and the independent variables "self-image", "Company's Brand reputation" and "brand personality". Second, To explore an equation to determine the optimum combination of three variables "self-image", "brand reputation" and "brand personality" in order to maximize the purchase intention. In this equation, either independent or dependent variables are gained by the discovery and determining path coefficients. The study is used extensively for activists in the field of automotive industry.

INTRODUCTION

In twenty-first century due to increasing advances in technology and innovation, increasing competition and demanding customers, brand management has become one of the most complex tasks. As the world moves toward globalization, the move from marketing to brand management is necessary. Generally, two general categories of company brand and product brand are classified. Compared with the company's brand, product brand has absorbed more attention among researchers in the field of brand, Keller (2003) has pointed out that the company's brand, is able to create an overall judgment immediately after purchase. Compared with the product brand, the company's brand has an indirect influence on consumer decision making [1]. This article focuses on both the product brand and the company's brand. Brand reputation is a key factor to determine the success of a company [2]. and it is an essential part of a company's reputation which is related to its past and future activities. Goldsmith et al. (2000) refers to a company's reputation as the degree to which investors, customers and other supply chain components believe in company's honesty and expertise; this is similar to the definition of company's reputation. "Company's reputation" means to the extent that, according to customers' opinions, a company can satisfy customers by offering high quality products [3]. Fewer studies have been conducted on the impact of brand reputation on customer decisions, than the studies on the validity of the whole [4]. But in recent years and especially given the global financial crisis, branding or Brand making a company has attracted a lot of attention. Brand reputation is composed of three parts: Expertise, likeability and accuracy [3]. Based on the studies that have been done in the past, it can be concluded that the higher a company's brand reputation, the higher customer's purchase intention [2]. Another concept in marketing which has attracted much attention is the brand personality; which refers to the relatedness of Human characteristics and traits to the brand [5]. Visual personality of a brand can often be determined by what is stamped in the customer's mind and imagination: In fact, it is the personality characteristics of a consumer who consumes the brand. Through the use of a brand, a consumer can improve his ideal and real self [6]. It is also assumed that the characteristics of the product brand can have effect on customers' purchase intention [7]. This study aims to explore the relationship and effect of "brand reputation" and "brand personality" on customers' purchase intention. Secondly, this study tries to determine the optimum combination of brand reputation and brand personality and self-image congruence, by using genetic algorithms. This means that with what combination of the four elements, and with what range of emphasis Iran Khodro can maximize its customers' purchase intention.

Conceptual background and hypothesis development
Company's brand reputation

Brand reputation means that to what extent the recipient believes that he presents the related source of knowledge. Therefore, the expert can trust this source [8]. Source credibility can show the ads accuracy, and hence, it affects the attitudes and purchase intentions along with the advertisements [9]. This concept can be explored in three parts: Expertise, integrity and attractiveness [8]. Creditability can also refer to a company's brand reputation. Recent studies have shown that a company's brand reputation plays an important role in influencing customer purchase, the company's reputation and credibility of the advertiser [4, 10]. In addition to all this, a company's brand reputation can illustrate the image associated with the product's brand [11]. Company brands represent all accessories of the product's brand, values, attitudes,

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evaluations, interests, relationships and the company's reputation. A company's brand reputation is essential to the ultimate success of the company's brand making strategy. If a company's brand reputation is weak. It causes customers to become skeptical about buying the company's products. And doubt whether the company has the ability to provide quality products [2]. [12] believed that a company's brand reputation consists of several components that include Vision, culture, position, personality and relationship with other shareholders and stakeholders of the company. As [5] stated that the brand's identity consists of twelve dimensions, focused on four sides: Brand as a product brand as a person, Brand as a company, and the brand as a [11]. In contrast, positive and strong reputation of a company's brand also promotes brand image and equity, and therefore increase purchase intention [11]. Thus it can be said that the perceived reputation of a company is positively related to sales; therefore, the first hypothesis is proposed as:

First hypothesis: the higher a company's brand reputation, the higher purchasing intention

Product's brand personality. The brand has personality and reflects personality characteristics to customers and shareholders. In fact, the idea of brand's property originated from human features and characteristics [13]. Brand personality means human characteristics that allocates to a brand [5, 14, 15]. Brand personality makes the client get involved with a particular brand, evaluate it, keep it in mind and also maintain a strong brand [16, 17]. Aaker (1997) believes that the brand personality is different from the human personality. In this respect the human personality and his personality traits will be reflected in his behaviors, actions, attitudes, values and beliefs. But the brand personality is reflected in human contact with the product and features that the brand represents. Keller (1993) argues that the brand's personality indicates symbolic values, which are beyond the tool like application of the product's brand. Customers can achieve higher self-esteem, through the use of selected brands and ascribe human characteristics to them. Aaker (1997) offers a grading scale and a wider range of dimensions that can be used to describe the brand personality, which include Devotion (being humble, being honest and being cheerful); excitement (courage, being excited and being up to date); Complexity (being upscale and attractiveness); resistance (being exterior and tightness). Having a strong and positive brand personality will improve consumers' assessments about the brand and ultimately will lead to a better purchasing intention [18]. Another model proposed by Bosnjak et al (2007) for the brand personality, its dimensions include being raised, superficial, emotional and serious. Gvyns et al (2009) have proposed a different model for the brand personality, which implies that the brand's personality includes: accountability, being active, simple, emotional and aggressive. In addition to all this, Fennis et al (2005) found that the brand personality has a good influence on human personality traits such as being consistent, being clever, conscientious and serious. In fact, some researchers have found that human personality and personality of the brand are dependent on each other [18]. Wang and Yang (2008) also found that brand personality is strongly and positively related to customer assessments about products. A large number of studies have found that brand personality has a key role in the formation of favorable attitude toward the brand, customer satisfaction, customer loyalty and recommendation of the brand to others [17, 16]. Therefore, the second hypothesis of this study is:

The second hypothesis: product brand personality is positively associated with customer purchase intention

Self-image

Based on the theory of self-image congruence, congruence between consumers' self-image and brand-user image can affect consumer behavior [19]. Congruence of the self-image can be divided into four categories: Real, ideal, social, social ideal. Real Congruence relates to its congruence between the real person and their thoughts about how a regular user should be specified. Ideal Congruence refers to the comparison between the characteristics of a common user and what a typical user wants to be. Social Congruence compares the features of a common user with what other important people see about these characteristics. Ideal social Congruence compares the features of a common user with what he wants to be seen by other important people. If Congruence is maintained between the individual's self-image and the brand' self-image, self- Congruency occurs at a high level, and vice versa. The influence of self-image congruence on brand choice, preference and loyalty has been widely studied in the marketing literature [20]. Previous studies also have shown that self-image Congruence leads to a better assessment of the product, higher satisfaction and more purchase intention [20, 19]. As a gap that is expected to be examined in future research, Wang and Yang (2011) study deals with Advertising anecdotal and self-image, which, on the basis of this study, can be used as independent variables. The present study attempts to consider self-image as an independent variable to eliminate gaps in previous research.

The Third Hypothesis: high levels of self-image Congruence increases the customer purchase intention Finally, this study is trying to investigate the relationships of each of the variables of self-image, brand personality and brand reputation, with the customer's purchase intention. In the second phase: we will explore the modifying effect of the company's brand reputation on the relationship of self-image and brand personality with the customer's purchase intention. Finally, using the technique of genetic algorithm, and to maximize customer purchase intention, the optimum combination of the three variables of brand reputation, personality and self-image is investigated.

MATERIALS AND METHODS

Questionnaire and assessment tools

The questionnaire for this study was provided in two parts: The first part of the study is demographic information; the second section is devoted to the questions that measure the study's four main variables: self-image, brand personality, brand reputation and purchase intention. The questionnaire was distributed in the Persian language, and has been considered by many PhD students to be quite fluent with no translation errors. Product brand personality is measured by using Aaker (1997) criterion: which, as earlier noted in the study, includes devotion, competence, excitement, complexity and stimulation. Likert scale includes five factors ranging from "strongly agree" to "totally disagree". Questions related to the company's brand reputation has been picked from Ohanian (1990) and involves four items of "I Trust Company", "the company claims are true" that measures Trust; "the company is good and skillful at the work she's doing" and "the company is highly specialized" that measures Expertise. "The company is attractive" and "I love the company's brand", represents the likeability of the company's brand. Hence, The Company's brand reputation includes several elements that are attractiveness, reliability and expertise of the company. self-image Congruence has been set by using Borax (1985) questionnaire, which includes these items: "the company Brand's image is matched with the image of my own"; "The brand image of the company, reflects that who I am"; "The people who are like me, use such brand"; the company Brand's image is like a mirror, reflecting my own.

Validity and Reliability test

To gather data, a researcher-made questionnaire was used whose face validity was confirmed based on the ideas of the experts. To measure its consistency, Chronbach Alpha coefficient was calculated. Generally, for the questionnaire related to psychological tests, Chronbach Alpha value over 0.7 is acceptable. For this study, Alpha value of 0.986 was achieved, confirming its high consistency [Table 1].

Table1: Reliability Test

Variable	Chronbach Alpha coefficient
Brand Credit	0/71
Brand Personality	0/84
Self-Image	0/83
Purchase intention	0/8
Total	0/8

Data collection and sample

The statistical population of this study is the Automobile owners of Iran Khodro Company in Tehran City. Tehran is one of the biggest and the most populated cities in Iran which has several different personal cars and Iran Khodro Company is one of the greatest car providers in Iran country. Iran Khodro Company is the biggest automobile producer company which has 48% part and 57% worth of Automobile market share in Iran. Iran Khodro Company is recognized as a biggest exporter in Iran industry. Thus, the statistical population of this study is the Automobile owners of Iran Khodro Company in Tehran City. Sampling way in this study, is nonrandom accessible. In this way, the researcher distributes questionnaires in crowded places like Fuel stations and international exhibitions. So, in summary, considerable brand in this study is Iran Khodro and product brands are: Samand (LX, Severn), Peugeot (405, 206, Pars), Dena, Rana. The total number of questionnaires collected, is 410 and the number questionnaires after reviewing is 253, which was usable.

Table2: Demographic information

Demographic variable	Answers	Frequency	Percent	Cumulative frequency percent
Gender	Female	12	4	4
	Male	13	5	10
Age	Less than 2	1	26.4	42.9
	24-3	5	42.9	69.3
	30-4	5	26.4	95.7
	Above 4	10	4.3	100
	Samand LX	22	9.4	9.4
Automobile type	Samand Souren	30	12.9	22.3
	Rano	118	50.6	73
	Peugeot	63	30	100

As it is clear on the [Table 2], numbers of 53 percent of despondence are male and 47 percent are female and most of them are within 24-30 years old. Moreover, types of despondence automobile are Samand LX, Souren, Rano and Peugeot.

The research first target: Hypothesis analysis and the research conceptual model

To analyze data, a two-stage structural equations modeling, was used. First, measurement model fitness was tested using confirmatory factor analysis; then, a path analysis was used to analyze the hypotheses. A structural equation modeling developed the correlations between latent and observable variables. Here, latent variables were main variables. Observable variables were the questions in the questionnaire, used as a variable in the analysis software of PLS and final model.

First part: analyzing the measurement model

In [Table 3] confirmatory factor analysis (Kaiser Criterion) specifies the suitability of data for factor analysis. This criterion is varying between 0 - 1. The amount of this criterion must be above than 0.5, if the sample is suitable. For this study in table3, the criterion is 0.813, so, confirmatory factor analysis is suitable for this data collection.

Table 3: Kaiser Criterion

Kaiser Criterion	0.813	
Bartlett test	Rotation test	1516.205
	Signal	0

Measurement model fitness

Although different kinds of tests, generally called Fit Indexes, are continuously being compared, developed, and completed, there isn't consensus on any single optimum test yet. So, various articles have represented different indices and even famous programs of structural equations like Amos and Lisrel software give several Fit Indexes [21]. Those indices are classified by different methods from which the most leading is classification of absolute, relative external and internal indices. Each of these indices is between 0-1. Table 4 shows the Fit Indexes of the conceptual model in this research.

Table 4: The Fit Indexes of the conceptual model in this research

Index type	Index value
Absolute	0.664
Relative	0.783
External	0.825
internal	0.906

According to [22], Fit Indexes with the values over 0.7 are satisfactory while values less than 0.6 indicate the weakness of the model. Zhang (2003) has also considered the values higher than 0.5 as pleasant ones for model fitness. So, according to [Table 4], research model is fit and confirmed. Then, path analysis results can be used and interpreted for hypothesis test.

Research hypotheses

This model shows the values of correlation among latent variables that in other words are visual conceptions of the model. According to correlation values or coefficients, research hypotheses are confirmed or rejected. In this part, first hypotheses and then their investigations will be represented:

First hypotheses: higher brand credit will caused the higher purchase intention.

In [Table 5 and 6]correlation coefficient of two variables is 0.219 and the coefficient is 0.48, implying that 48 percent of the changes in the purchase intention comes from the changes in Brand credibility amount. Variance analysis table shows that regression model is significant. Coefficient table also revealed that brand credit variable has a significant effect on purchase intention; because, it's significant level is zero (< 0.05).

Second hypotheses: brand personality of products is positively related to purchase intention

In Table 5 and 6 correlation coefficient is 0.256 and determination coefficient is 0.65, implying that 65 % of the changes in the purchase intention comes from the change in brand personality. Variance analysis table also shows that regression model is significant. Coefficients table shows that brand personality variable has a significant effect on the purchase intention; because, its significance level is zero.

Third hypotheses: higher levels of self-image, causes higher levels of purchase intention

As seen in [Table 5 and 6], adding self-image variable to the model, correlation and determination coefficients of the model increase, implying that it improves purchase intention because of the self-image. The regression model is also significant.

Table 5: Path analyzing for the total

Independence variable	Path coefficient	Test index	Significance	Result
Corporate brand	0.653	4.187	000	Confirmed
Brand personality	0.45	4.127	000	Confirmed
Self-image	0.436	3.562	000	confirmed

Table 6: Correlation and determination coefficients of the hypotheses

Model	Correlation	determination coefficients	modified correlation
Brand credibility	0.256	0.65	0.062
Brand personality	0.257	0.71	0.064
Self-image	0.219	0.48	0.044

The second main target (optimizing by using Genetic Algorithm)

To determine the optimize level of four products (Samand, LX, Peugeot, Pride) is the second major target of the present study. In fact, in this part the main goal is to understand how to maximize purchase intention by concentrating on three variables of brand personality, brand credibility and self-image. For this reason, genetic algorithm is used. In this way, path coefficients which are showing the strength and the power of the path between two variables (purchase intention) and (brand credibility, self-image and brand personality) has been used. So, it is trying to consider the relationship between variables separately as it is mentioned in [Table7]

Table 7: Path analyzing for Samand product

Independence variable	Path coefficient	Test index	Significance	Result
Corporate brand	0.553	8.187	000	Confirmed
Brand personality	0.35	2.7	000	Confirmed
Self-image	0.136	5.255	000	confirmed

So, this formula is resulted for Samand product:

Brand credibility :X1 ·brand personality :X2 ·self-image :X3 ·purchase intention :Z

$$.553X1 + .35X2 + .136X3 = MAX(Z)$$

$0 \leq X1, X2, X3 \leq 100$

It is assumed that the number of automobile for each kind of them is a stable number. Now, with regard to produced automobiles, the level of priority for each three variables will be determined. In this way, the resulted formula by using genetic algorithm, with assumed population: 100 and mutation rate of 0.07 is analyzed. So, the results are as follow:

$X1=0/46$

$X2=0/75$

$X3=0/68$

$Z= 0/226$

It showed that this company must concentrate on brand personality, then self-image and the last on brand credibility.

RESULTS

maximizing purchase intention for LX product

This operation is the same as the last on data are presented on [Table 8]

Table 8: Path analyzing for LX product

Independence variable	Path coefficient	Test index	Significance	Result
Corporate brand	0.653	4.152	000	Confirmed
Brand personality	0.45	4.127	000	Confirmed
Self-image	0.436	3.562	000	confirmed

Brand credibility :X1 «brand personality :X2 «self-image :X3 «purchase intention :Z

$$".653X1 + .45$$

The formula:

$$0 \leq X1, X2, X3 \leq 100$$

So, the results are as follow:

$$X1=0/96$$

$$X2=0/75$$

$$X3=0/58$$

$$Z= 0/121$$

It showed that this company must concentrate on brand personality, then brand credibility and the last on self-image.

maximizing purchase intention for Peugeot

This operation is the same as the last on data are presented on [Table 9]

Table 9: Path analyzing for Peugeot product

Independence variable	Path coefficient	Test index	Significance	Result
Corporate brand	0.453	4.100	000	Confirmed
Brand personality	0.25	2.157	000	Confirmed
Self-image	0.736	3.662	000	confirmed

Brand credibility :X1 «brand personality :X2 «self-image :X3 «purchase intention :Z

$$".153X1$$

The formula: $0 \leq X1, X2, X3 \leq 100$

So, the results are as follow:

$$X1=0/83$$

$$X2=0/55$$

$$X3=0/39$$

$$Z= 0/226$$

It showed that this company must concentrate on brand credibility, then brand personality and the last on self-image. As it is presented on [Table 10].

Table 10: Path analyzing for Reno product

Independence variable	Path coefficient	Test index	Significance	Result
Corporate brand	0.456	3.320	000	Confirmed
Brand personality	0.265	3.157	000	Confirmed
Self-image	0.236	3.062	000	confirmed

Brand credibility :X1 «brand personality :X2 «self-image :X3 «purchase intention :Z

$$.153X1 + .250X2 + .736X3 = MAX$$

The formula: $0 \leq X1, X2, X3 \leq 100$

So, the results are as follow:

$$X1=0/91$$

$$X2=0/263$$

$$X3=0/248$$

$$Z= 0/126$$

It showed that this company must concentrate on brand credibility, then brand personality and the last on self-image.

CONCLUSION

Due to increasing advances in technology and innovation, increased competition and demanding customers, brand management in the twenty-first century has become one of the most complex tasks. As the world moves toward globalization, the move from marketing to brand management is necessary. The paper was trying to explore the relationship of the brand personality, brand reputation and self-image with the customers' purchasing intention of Iran Khodro Company. Iran Khodro is one of the companies which are exclusively active in manufacturing various cars; including some brands such as Samand Soren, Samand LX, Peugeot 206 and Pride. The study will follow two main goals: firstly, to explore the relationship of the three variables of self-image, brand reputation and brand personality with purchase intention. Second, To explore an equation to determine the optimum combination of three variables "self-image", "brand reputation" and "brand personality" in order to maximize the purchase intention. For this purpose, 410 questionnaires were distributed among owners of different types of Iran Khodro cars, but possible analyzable questionnaires were 253. To achieve the first goal, the PLS software was used to determine the path coefficients between dependent and independent variables. Then, the path coefficients are calculated for each type of vehicle brands _including L. X, Soren, Dena and 206; to determine the optimum combination of dependent variables to maximize purchase intention. It was considered that the company's brand reputation is equivalent to variable X-1, brand personality to variable X-2, self-image to variable X-3; and maximizing the purchase intention is regarded as the objective. Then each of the equations for each product brands was put in the genetic algorithm. The results have shown that In the case of products such as Reno, Peugeot 206 and Samand EL X, the emphasis should be on promoting the company's brand reputation, the brand personality, and ultimately on its self-image, respectively. But this optimal combination for Samand Soren is different and the emphasis should be on brand personality.

CONFLICT OF INTEREST

There is no conflict of interest.

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REFERENCES

- [1] Keller KL, Richey K. [2006] The importance of corporate brand personality traits to a successful 21st century business. *Journal of Brand Management*, 14(1/2), 74-81. <http://doi.org/10.1057/palgrave.bm.2550055>
- [2] Goldsmith RE, Lafferty B a, & Newell, S. J. (2000). The Impact of Corporate Credibility and Celebrity Credibility on Consumer Reaction to Advertisements and Brands. *Journal of Advertising*, 29(3), 43-54. <http://doi.org/10.1080/00913367.2000.10673616>
- [3] Keller KL. [2008] Strategic Brand Management. *Brand*, 58, 829. <http://doi.org/10.2307/1252315>
- [4] Lafferty B. a. oldsmith RE, Newell SJ. [2002] The Dual Credibility Model:The Influence Of Corporate And Endorser Credibility On Attitudes And Purchase Intentions. *Journal of Marketing Theory and Practice*. Aaker, J L. (1997). Dimensions of Brand Personality. *Journal of Marketing Research*, 34, 347. <http://doi.org/10.2307/3151897>
- [5] <http://doi.org/http://www.jstor.org/stable/41304270>
- [6] Sirgy M J, Grewal D, Mangleburg, T. [2000]mRetail Environment, Self-Congruity, Wang, X. & Yang, Z. (2008). Does country-of-origin matter in the relationship between brand personality and purchase intention in emerging economies? : Evidence from China's auto industry. *International Marketing Review*, 25(4): 458-474.
- [7] and Retail Patronage. *Journal of Business Research*, 49(2): 127-138.
- [8] Ohanian R. [1990] Construction and Validation of a Scale to Measure Celebrity Endorsers' Perceived Expertise, Trustworthiness, and Attractiveness. *Journal of Advertising*, 19(3), 39-52. <http://doi.org/10.2307/4188769>
- [9] Lutz R J McKenzie SB, Belch GE. [1983] Attitude Toward the Ad As a Mediator of Advertising Effectiveness: Determinants and Consequences. *Advances in Consumer Research*.
- [10] Hamzah ZL, Syed Alwi S F, Othman M N.[2014]Designing corporate brand experience in an online context: A qualitative

- insight. *Journal of Business Research*, 67(11):2299–2310. <http://doi.org/10.1016/j.jbusres.2014.06.018>.
- [11] Buil I. Catalán S, Martínez E. [2015] The importance of corporate brand identity in business management: An application to the UK banking sector. *BRQ De Chernatony, L. (2010). From Brand Vision to Brand Evaluation. The Strategic Process of Growing and Strengthening Brands (3rd ed.). United States of America.*
- [12] *Business Research Quarterly*.
- [13] Simões C, Singh. JG Perin M. [2015] Corporate brand expressions in business-to-business companies' websites: Evidence from Brazil and India, *Industrial Marketing Management xxx (2015) xxx–xxx*.
- [14] Valette-Florence, R. & De Barnier, V. (2013). Towards a micro conception of brand personality: An application for print media brands in a French context. *Journal of Business Research*, 66(7): 897–903.
- [15] Valette-Florence, R. & De Barnier, V. (2013). Towards a micro conception of brand personality: An application for print media brands in a French context. *Journal of Business Research*, 66(7), 897–903.
- [16] Kapferer, J. (2008). *The New Strategic Brand Management: Creating and Sustaining Brand Equity Long Term*. London: Kogan-Page . Retrieved from <http://www.amazon.de/The-New-Strategic-Brand> .
- [17] Avis M. (2012). Brand personality factor based models: A critical review. *Australasian Marketing Journal*, 20(1), 89–96. <http://doi.org/10.1016/j.ausmj.2011.08.003>
- [18] Sirgy MJ, Grewal D, Mangleburg TF Park, JO Chon, KS. Claiborn, C B, Berkman H. [1997] Assessing the Predictive Validity of Two Methods of Measuring Self-Image Congruence. *Journal of the Academy of Marketing Science*, 25(3):229–241. <http://doi.org/10.1177/0092070397253004>
- [19] Sirgy MJ, Johar JS. [1999] Toward an integrated model of self-congruity and functional congruity. *European Advances in Consumer Research*, 4(1), 252–256.
- [20] Hooman, H. (2007). *Structural Equation Modeling Using Lisrel Software*. Samt Publication. 1st Ed.
- [21] Henseler J, Ringle, CM, Sinkovics, R, [2009] The Use Of Partial Least Squares Path Modeling In International Marketing. *New Challenges to International Marketing* Keller, K L. (1993). Conceptualizing, Measuring, and Managing Customer-Based Brand Equity. *Journal of Marketing*, 57(1): 1–22. <http://doi.org/10.2307/1252054>
- [22] Henseler J, Ringle CM, Sinkovics R. [2009] The Use Of Partial Least Squares Path Modeling In International Marketing. *New Challenges to International Marketing Advances in International Marketing*, 20: 217– 319.
- [23] Fennis, B. M. Pruyn, A. T. H. & Maasland, M. (2005). Revisiting the Malleable Self: Brand Effects on Consumer Self-Perceptions of Personality Traits. *Advances in Consumer Research*, 32(1):371–377.
- [24] Freling, T. H. & Forbes, L. P. (2005). An empirical analysis of the brand personality effect. *Journal of Product & Brand Management*, 14(7): 404–413. <http://doi.org/10.1108/10610420510633350>
- [25] Bagozzi, R. P. & Tybout AM. (1983). *Advances in Consumer Research*. Vol. 10. Ann Arbor, Association for Consumer Research
- [26] Bosnjak M. Bochmann V, Hufschmidt T. [2007] Dimensions of Brand Personality Attributions: a Person-Centric Approach in the German Cultural Context. *Social Behavior and Personality: An International Journal*, 35(3):303–316. <http://doi.org/10.2224/sbp.2007.35.3.303>
- [27] Geuens M. Weijters B, De Wulf K. [2009] A new measure of brand personality. *International Journal of Research in Marketing*, 26(2), 97–107. <http://doi.org/10.1016/j.ijresmar.2008.12.002>
- [28] Keller, K. L. (1993). Conceptualizing, Measuring, and Managing Customer-Based Brand Equity. *Journal of Marketing*, 57(1):1–22. <http://doi.org/10.2307/1252054>
- [29] Zhang D. [2003] Delivery of personalized & adaptive content to mobile devices: a framework & enabling technology, *Journal of Communication of the AIS*, 12(13):183–202.

ARTICLE

EPIC AND MYSTIC HERO IN PERSIAN CULTURE- A COMPARATIVE STUDY ON THE CHARACTERS OF HERO IN SHAHNAMEH OF FIRDAUSI BESIDES PERSIAN MINIATURES

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ABSTRACT

This Paper deals with the nature and characteristics of the epic and mystic hero. A Persian epic hero should be followed in myths according to the primitive folklore ideas of these people. These epics could be found in Persian literature specially "Shahnameh of Firdausi". According to the social history of Iran, these epic characters were interpreted as mystical ones, literary visualization of which represented in mystic stories of "Sohrawardi" as well as pictorial imaginary is shown in Iranian miniatures for "Shahnameh" in all schools of Persian painting- specially Safavied school. After a brief summary of the mythical hero, this article will explain the various sides of the epic hero's structure and analyzes the character of a mystical hero based on traditional theories of art. In the case of heroes, there are some differences between mythical and mystical views. For mythical view, a hero is a superman who overcomes personal limits and leaves his normal life and succeeds to travel through a risky path. An epic hero is also a superman who struggles for the pride of a nation. His battle is a battle of good and evil and his character is based on the dualism of which epic stories represent carefully. But in mystic view of miniatures, a human is the God- Almighty successor on the earth displaying a prototype visualized by the perfect human.

INTRODUCTION

Issue and aims' explanation: The purpose of this study is the implication and comparison of two kinds of hero's features- epical and mystical hero- those of which are personage of epic and mystical narratives. The hero is the major character in epics upon whom the structure of epic narratives is based. The most reliable version of Persian epics been reflected in Shahnameh of Firdausi, the great Persian poet. Shahnameh is a complete set of myths and Epical narratives through which the fictional history of ancient Persia before Islam become unveiled. In subsequent periods, these epics and their characters appeared in a different way as we may observe in mystic stories, including the symbolic legends of Suhrawardi- the illuminationist philosopher- and other pictorial narratives of Persian miniatures. This essay is going to explain features of the hero in these two types of narrative, considering structural systems and mystical theories.

Research questions

- What are the structural characteristics of an epic hero in Persian literary?
- What are the structural characteristics of a mystical hero in Persian literary and painting?

MATERIALS AND METHODS

This investigation is a comparative study which is done and presented by qualitative and descriptive-analytic method. This research is based on a literary review into original texts- Shahnameh of Firdausi, Persian miniatures and Sohrwardi's stories- as well as secondary texts which are written on Shahnameh, epic and mystical heroes and analysis of their characters- considering the difference between contexts, In order to analyze epic narrations, constructional methods based on the oppositions of narrative elements, as well as ideas of Muslim traditionalists who consider human as *Divine vicegerent*, are supposed to be addressed.

The nature of the epic hero; the hero and his signs in the Shahnameh of Firdausi

The Persian heroic poetry, from its beginning till now, has passed several stages. In the first stage, the protagonist is a god or a mythological personage. Mythology is related to custom, fiction and history and deals with the divine beings as well as semi-divine and supernatural beings and explains how a new civilization or a heroic act created by supernatural actions. In mythological view, human's activities become significant due to interferences of supernatural creatures [1]. The mythology of ancient Persia deals with not only cosmic battles and abstract concepts and personalities associated with religious rituals, but also legendary heroes and primary kings [2]. Generally a mythological hero is a man or a woman who overcomes individual limitations and leaves routine life. He has a perilous journey toward the territory of supernatural wonders and eventually wins. The mythological hero has specific benefits and his greatest action is taking hold of the epitome of unity in multiplicity and introducing it to others [3].

KEY WORDS

Heroism, Persian Painting and Book Illustration, Epic Hero, Mystical Hero, Heroes of Shahnameh

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Accordingly, such themes are narrated as stories with heroic actions. Prominence of the subject and the protagonist, who has to be perfect in all aspects, is one of the characteristic of this genre. Even his errors are heroic somehow. The epical hero is a superman who seeking fame, fights to gain glory or to draw honor for a nation. According to the Persian mythology, epical hero carries symbol of moral and emotional values indicating high wishes of an ancient nation [4]. In ancient Persian illumination, the good human and *Ahura Mazda*, the creator of goodness, are the same and inseparable, like the sun and its light; and the hero is a good human [5]. Reading heroes of *Shahnameh*, discloses how the spirit of ancient duality has been preserved [2].

Based on historical interpretation, one can state that the creative epoch of national Persian epic is Parthian period. Apparently the *Parthian* chivalrous spirit created a tradition and by which any bravery or heroic fighting has been considered by their name. (Hero in the Persian language is called *Pahlavan* which is derived from *Parthava*- the Parthian original country.) This tradition possessed not only martial but also moral aspects that could be called brigandage and chivalry. One of the most important examples is *Arash* the archer whom was considered as a great-grand father by many Parthian families. According to them, *Arash*- who gave his life to protect Iran's borders- was known as an archetype of heroic rituals and behaviors. A Parthian community of heroes was composed of *Kings* and *Princes* [6].

According to *Pahlavi* texts, some of heroes are also immortals. These tales of chivalry spread in Arsacide era. The heroic and epical spirit of the time placed Parthian heroes beside mythological prototypes. Heroism as a tradition, that is an arrangement of chivalry and generosity and quoted in *Shahnameh*- the book of kings, has some principles and properties which are discussed in the rest of the article.

The opposition of the good and the evil

An epic is a battle between opposites [7]. Actually, all battles are challenging with the evil; that of the Devil, falsehood, injustice, fighting, ruination- and this fact represents the Aryan historical attitude [8]. In *Avesta*- the *Zoroastrian* holy book- one can read about some great battles between good and evil elements, Iranians and the devils, Iranian heroes and *Transoxanians* [9]. and this is an origin of the national epic of Iran. The belief in two poles of *Ahura* and *Ahriman*- the God and the Devil in ancient religion in Persia- might be considered as the fundamental cause of ancient Iranian identity. In the framework of the religious beliefs of ancient Iran, two eternal contrasting elements are imagined as two primary partenaire elements. One of these two primary elements is the symbol of goodness and luminosity and another is the manifestation of decay and dimness which of both the world is created as a result of their conjunction.

Actually the battle between good and evil would take place always been destined until the end of the world. The eternal dualism in ancient Persian world-view, which has social and religious basis, has also been effective in the development of Persian epical traditions so reflected by them. In Persian epic, the opposition of good and evil has been appeared in the figure of a battle between two hostile nations, Iranian and *Anirani* (anti-Iranian), in the *Avesta*, as well called as *Iranians* and *Transoxanians* in *Shahnameh*. All of the *Shahnameh* unveils the narration of the true war between these two tribes, one of whom auspicious and *Ahuraian* and another blameworthy and *Ahrimanian* [10]. It's worthy of mention that the myths deserve categorically reveal dualism in human existence and contrasting powers of the world. As a result, the light and the darkness have always been mentioned as two contrary phenomena in Persian literary.

In *Shahnameh*- the story of a battle happened between *Keykhosrow* and *Transoxanians*- depictsthe phenomena of the light and the darkness; in such a way that the darkness becomes dominant on the sky before the war and gradually after the victory of Iranians the light appears. Iranian famous heroes in *Shahnameh*- such as *Rostam*, *Sohrab*, *Keykhosrow*, *Siavash* and *Foroud*- from Persian fathers (of *Ahura*) and *Transoxanian* mothers (of *Ahriman*) presented all together. They are manifestations of the coexistence of two contrary numinous and temporal essences- the spirit or the light and the material or the darkness; the existence of these heroes, the combination of which carry two contrasting natures [11]. Sometimes, in the battle of opposites, the evil forces overcome, but the blessing forces try to take back the *Royal Charisma* (*Farrah*). All of the heroes take part in battles in order to achieve the *Royal Charisma* [12].

The rank human in *Shahnameh* is so transcendental such a sublime higher than the nature and sphere. The perfect man, who is a symbol of greatness and goodness, becomes incarnated in heroes whose mission is achieving historical ideal. So idealism is a main aspect of spiritual lives and the war is a battle of good and evil obviously persisting in mythological and epic era.

The first battle is between *Tahmoureth* the king and the demons, then *Fereydun* the Persian prince and *Zahhak* the evil king. Then the war of good and evil is incarnated in revengeful battles between Iran and *Transoxania*. The last fight of the heroic era happened between the Persian royal family of *Lohrasb* and *Transoxanian Arjasb* over religious reasons [13]. After the reign of *Fereydun* and from the *Manuchehr*'s age, one group, whom are called the heroes, rose up to confront all wickedness; *Sam* and his son -*Zal*- and his grandson -*Rostam*- all relate to this era which continued until the death of *Rostam*. At that time,

even the kings were honored with their heroic level [6]. Meanwhile, the heroes has dyadic in their nature mirroring fusion of good and evil, the equal domination of Ahriman and Ahura on the world. This fact implies dualistic insight of epics. For example mother of Rostam is from the descent of Zahhak- the evil king; and mother of Keykhosrow is a daughter of Afrasiab- the king of *Transoxania*.

As a general rule, the heroes of Shahnameh, whom are the motives of the battle between good and evil, could be divided into three groups: The righteous heroes, some of whom are the completely innocent prototype of human, such as Freydun, Siyawash and Keykhosrow and some are not devoid of shortcomings and deficiencies, such as Rostam and Tuss; the evil heroes who in nature are the source of decay and mischievous all over, such as Zahhak and Afrasiab and some who represent unions of good and evil, such as Piran and Esfandiar- the Persian prince whom killed in a battle by Rostam. Such senses as acuteness, strength and manly solidity are considered common properties in all three groups.

The opposition of good reputation and disgrace

One of the most important concepts in heroic ethics is the honor and reputation. In the world of epics, dignity is more important than civil values, as the anger of Rostam with king Kawoos and the battle of Rostam and Esfandiyar indicate no motivation but name and shame. All human transcendental values and attributes are symbolized in the word of "*Name*" which is implicitly comprised of some values like justice, generosity, honesty, religious faith, loyalty, bravery and even patriotism. The heroes of Shahnameh always care about their own *Names* and defend their dignity which is the national conscious. The honor is the center of hero's existence so he fights and dies for it because a dishonorable man is no longer considered a hero, so he always worries about his dignity. Rostam kills a wise king like Esfandiyar for he couldn't accept to be under chains because self surrounding doesn't agree with the *Name*, and the infamy is the death of the championship [14]. Therefore, even the oldest heroes consider the failure as a shame. The refraction and escape from the enemy cause shamefulness.

This property isn't of the same importance in any kind of epic; for example in Greek epics, *Name* isn't the only stimulant and there are some other motives like seeking gratification, greediness and capriciousness; for example, in the Iliad of Homer, Ajax killed himself just because he had failed in competition with Ulysses for the possession of Achilles weapons. Or Achilles left the army because his female slave was kidnapped. And even the great battle of Troy occurred on the ownership of a beautiful woman [7].

The revengefulness

In heroic epics of Iran, the revengefulness battles happened not to satisfy selfishness and hegemony, but to fulfill a sacred duty, so becomes the main axis of the narration. The hero always sets the wise advice before his eyes: "Anyone who does wrong will be punished".

From the heroic perspective, revenging on wicked people considered as the sacred duty of a hero [4]. The revenge for blood of kings and princes is incumbent on Iranians. Everyone who does evil, particularly to the royal family will be punished and even his descendants might be affected by the result of his guilt. Anyone has the duty of taking his father's or ancestors' revenge.

Manuchehr takes his revenge for Iraj (his granddad); Keykhosrow took his revenge for Siyawash (his father) and heroes have a share in this national vengeance. Rostam destroyed Transoxaniatorevenge for blood of Siyawash. Besides, after falling in the well made by his brother, *Shaqad*, Rostam hit him into a tree with a shot to take revenge for his own death and punished that evil in his life [9]. Sometimes in taking revenge, even the kinship loses its value; Keykhosrow kills his grandfather- Afrasiab- while Farangis- the daughter of Afrasiab and the mother of Khosrow- indeed backs this revenge [15].

The heroic narrative

Birth and childhood

According to an old custom, the epic's narratordonates powers somesurprisingly to the hero from the moment of his birth or even earlier. The whole life of the hero is pictured as a pageantry of miracles, the climax of which is its central great adventure. The heroes are already chosen and this affair isn't acquired [3].

This fact had been predicted by Zoroastrian priests before the birth of Rostam and the marriage of his parents- Zal and Rudabe [13]. As a matter of fact king Kawoos wasn't killed after all the stupidity and boldness by him unless to bring up a son like Siyawash (Ibid, vol2, p308, verse414-415).

In most narrations the hero has a surprising birth like Rostam who was born through a miracle of *Phoenix*. Sometimes he is nourished by a symbolic nurse, like Freydun whose nurse is a well nourishing cow and Zal whose trainer is *Phoenix*[7]. Some of these versions show this theme in another different way as "banishment of the newborn child and his return". The end of the cycle of his childhood unites with the return or recognition of a hero and causes a crisis in the narrative [3]. The examples of this theme could be found in the story of Freydun and Zal [13].

The responsibility and examination

The hero should accomplish a great task in his life and leave behind him a better world than he set foot in. According to *Josef Campbell*, a hero appears when a great devilish enemy would have caught the kingship oppressively. And his first task and destined test is repression of the proud despotic king and purification of the society. According to history, apparently the heroes not only have been receiving the charter of sovereignty from the king but also have been crown-givers. It was customary during the Parthian period that one of the seven great Parthian families- *Suren*- put the crown on the king's head. This thesis suggests that the king's power has been taken from the great heroes (however, it isn't applicable in the case of despotic Sasanian kings who considered the kingship as a gift from the Lord, so they used to be crowned by themselves or by the high priest of the Zoroastrians) [6].

Also in epic poetry, the heroes contributed to the kingship and provided protection for him, taking revenge for the king, advising him and saving the country; as Rostam who attempted to find king *Qobad*, support *Siyawash* and *Keykhosrow* and revenge for *Siyawash* and *Nowzar*[9]. The mystical journey of the hero for his initiation and evolution is portrayed as traveling to marvelous lands, such as the seven exploits of *Rostam* or *Esfandiyar* [13]. In *Shahnameh* there are different examinations for achieving the heroic position, kingship or immortality. But the greatest and most difficult one is the seven exploits. The target of such an examination is coordinated with godly custom and moral values of the championship. The hero tries hard in a power manner to delegate a high name in accord with the ideal life and suitable death.

The Death: In the mythical and epic sections of *Shahnameh*, the longevity of some kings and heroes is more than 100 or 500 years; Such as *Manuchehr* who lived 120 and *Kawoos* who lived 150 years. *Zal* lived so long that he is present in the first book of *Shahnameh* until the sixth one; and *Rostam* has lived for more than 500 years [11].

The last action of the hero, which is presented in his biography, is his death or departure which surely doesn't scare him at all [3]. However, the painful death of a hero is sometimes accompanied by some kind of new life under the auspices of a change and transformation. An example of this subject is the death of *Siyawash* that led to immanence in a new corporal frame- a planet which was originated from his blood while his mission has been followed by his son- *Keykhosrow*.

In fact when son follows his father after the transformation to a sublime condition, one of the main themes in *Shahnameh* become disclosed throughout stories of *Siyamak*, *Iraj*, *Abtin* and *Siyawash* [11]. The epic hero submits himself to death because no one can dare to face the death. Nevertheless the death is the end of his journey and the top of his life. The meaning of a hero's life is completed by the style of his death [15].

The opposition of love and war

Some stories of *Shahnameh* talk about female characteristics hidden in love, tender and feelings and the descriptions of the beauty and purity where as the glory, dignity and the descriptions of mane, varnish and the chivalry belongs to heroes. In the story of *Zal and Rudabeh*, there is a great battle between love and racism and hostility which causes the parting between the two lovers. Most of the love stories -such as this one, the love of *Bijan* and *Manije* and *Ardeshir* and *Golnar*- end in favor of the interest of the country nation and prepare the way for the emergence of the heroes or new victories against the enemies. Therefore loves constituted as part of championships.

The story of *Rudabehh* and *Zal* is an introduction to the emergence of *Rostam* and his battles. The love story of *Tahmineh* and *Rostam* causes the greatest heroic story- *Rostam* and *Sohrab*. In *Shahnameh* love and epic stories can't be separated, because in this book there is no melancholic love or a kind of infatuation that leads to weakness or insanity. The heroes, who are in love, keep their manhood and heroic virtues. Sometimes a political event or war is prefaced by a love story. The love between *Kawoos* and *Sudabeh* created as the preface of the great battle between *Rustam* and the king of *Hamavaran* and the love of *Sudabeh* to *Siyawash* regarded as the basis of the Iranian- *Transoxanian* battles. Thus *Golnar's* love to *Ardeshir* resulted in *Sassanid* dynasty. The kingly love is accompanied by glory and official ceremonies; *Kawoos* officially brought up his marriage proposal with father of *Sudabeh*. Heroes keep the customs in their love too, as *Rostam* didn't refuse to call a priest and marry to *Tahmineh* officially[9].

Power Vis-à-Vis wisdom

The heroes had sacred and spiritual statues and superhuman powers. They prevail over evils with the help of supernatural agents, like the Divine glory, the messenger angel and Phoenix. From the spiritual point of view, they were considered symbols of wisdom and justice spiritually. Although they often worked by their mussel not rely exclusively on the powerful hands of god and immortal beings like as what we see in ancient Greek heroes [8]. However, there are many miracles among them; they fight single-handedly with an army and kill their hostile rivals all. Each of them- *Rostam*, *Esfandiyar*, *Geev*, *Bijan* or any other hero- is equal to a military. Also *Rostam* is so tall, looks taller than any standing man when he sits; is so strong that grubs up a tree like the grass and takes the stone, which seven heroes can't lift, from the top of *Bijan's*

well; takes away the rock that Bahman hurled at him by his foot. The stones break into pieces under his feet. He fights with a lion, a dragon, a wizard and a demon. The Persian hero doesn't recognize the fear. Rostam went to sleep among the enemies and demons in the meadow. According to Shahnameh, the human virtues include: art (acquired virtues), substance (essential virtues), the race and wisdom which are the best divine blessing [16]. The heroism is not limited to courage in the battlefield, but requires wisdom too. The bravery and knowledge are associated with the nature of a great hero such as Rostam, Keykhosrow and others. The coordination among the success, wisdom and justice is the goal of heroism. The seizing of time and escaping to the world of love and wine- that even Rostam in his moments of boredom resorts to- is a heroic feature[8]. The Persian champions are more powerful than usual even in drinking so that they never become drunk. The heroes always live wisely and never become a slave of the greed or a plaything for the whimsy.

The opposition of the reality and hyper-reality

An epic hero is shown as a mixture of reality and imagination. An ordinary man sometimes shows extraordinary aspects. The heroes, while being human, have utopian traits. An epic hero is a representative of his nation reflecting the best national characteristics. While the superhuman heroes are fallible, they have exceptional traits. However, all heroes in Shahnameh are presented with realistic human feature[14]. Although the heroes of Shahnameh have imaginary properties, they reflect nothing but the great contemporary spirit of the people [8]. The epic human is natural and he fights with natural and supernatural powers because of his nature. The idealization of the hero in Shahnameh doesn't mean that its stories are devoid of realism and dramatic features. Firdausi tries to express the complicated contradictions in the personality of some heroes, for example the contrariety of brave traits and emotional features in the personality of Eskandar (Alexander the Great) [17].

Magic in front of destiny

The magic is very important in the epic poetry. An Iranian hero is afraid of the lie and magic therefore he antagonizes the magicians. He never lies except for saving Iran and the king or for keeping his good reputation and only if he finds no other way. But the enemies resort to magic and deception, just to save their own lives and they don't refrain from cowardice and escape, especially against the great Persian champions. In Shahnameh the greatest magicians are the demons. These creatures are so skilled in magic that the forces of nature are under their control. To fight against demons is the most difficult stage of the battle. The greatest hero of Shahnameh- Rostam- fights against Akvan the demon, White demon and Arjang.

Although the human beings conjure too, fighting against the magicians is one of the duties of the Persian kings and heroes. One of the seven exploits of Rostam and Esfandiyar is the murder of the witch. The war with the magicians is more evident in the Mythical part of the Shahnameh. The wizards are skilled human beings who are able to control the nature or make the cold and rain. But the good heroes rarely resort to magic; so that Rostam did magic- on Esfandiyar- only once because of the fame with the guidance of Phoenix and finally confessed his sin in front of him [9]. The adventures of Shahnameh are influenced by the fate; so that a human attempts to change his destiny but isn't able to succeed. The fate of kings and heroes shows the invalidity of the world. The long lives of Jamshid and Zal and Rostam come to an end. The manly powers on earth are disappeared while at the same time the innocent youth caught in death. For his glory, Rostam is not only the embodiment of the lost power of the Iranian nation, but also he is the symbol of the being-Iranian which is broken by the historical fate. The heroes are selected to endure their destiny with satisfaction. The athleticism and power of Rostam against his powerlessness and uncertainty show his abilities and associate the mental context of a nation who is doomed to decay. The greatness of a hero narrated besides human grief for the instability of the world, which provided the glory of Shahnameh by their opposition, are the main elements of the Persian epics[18]. Thus, the prediction is very common in epic stories. In Shahnameh, many great events unveiled to the kings and heroes by the discoveries of astrologers and fortune tellers and interpreters of dreams. Zahhak became aware of the fall of his kingdom through the reports of interpreters of dreams. Sam, in his dream, discovered that Zal is hidden in the mountain of Alborz. King Manuchehr asked the priests about the marriage of Zal and Rudabeh and the birth of Rostam. Also king Afrasiab heard from the astrologers that Keykhosrow will destroy his kingdom [13]. In general, the prediction was revealing the secrets to the heroes inspiring them to seek a remedy, but it was of no use to conquer the fate and destiny. A hero surrenders to the fate and recommends joyfulness and utilization of the life and forgetfulness of the sorrow; not withstanding that the wine is considered as a healing material by the heroes and when they are sad they remember the wine and drunkenness.

Accessories for champions

In Shahnameh, the artillery weapons include things like: helmet, caftan, armor, wand, sword, bow, arrow, lasso, shield and ax. The military musical instruments- such as Indian bells, brazen pipes, bounds, horns, clarions, trumpets, golden bells, cymbals and drums- all were used in the battles. These instruments used

for gathering the army, the order of movement or attack and so on. The fighters have to protect their weapons very carefully because it would be a great shame if their weapons even a scourge of them is taken by the enemy. The horses were very important in the battlefield too; of which some enjoyed a great dignity; such as Rakhsh, the horse of Rostam, Shabrang-Bezhad, the horse of Siyawash. The usage of the elephants also possesses a high attention in Shahnameh. One may observe in some famed battles, how the elephants move with the golden thorn and the elephant watch.

Other important heroic characters

Most heroes of the Shahnameh mentioned to be Iranians. They are rarely found in the army of Transoxania. If there is one, he must be from a king's race- means the family of the son of king Fereydoon, Tour, who has inherited the championship from the royal family of Iran, or he might be an ordinary man who is a little faster and stronger than the normal persons. But the Iran, as Shahnameh insists on, is a place of the robust and manly heroes. The heroes of Shahnameh have all national good traits; like patriotism, obedience, manliness and greatness of spirit. But the heroic glory or fortune is also a divine gift, which is the source of strength and success of the hero [9] [16].

RESULTS

The nature of hero in Persian mystical literature and painting

In the history of Persian painting, there are many works of different themes- epic, lyrical, mystical and ethical- which generally describe the universal man. There has been a common or general convention in portraying the characters pictured in paintings[19]. The paintings don't show an accurate image of the physical appearances of the individuals; as one may conclude that only public types are considered here, especially in the Timurid school of Herat and the Safavid school of Tabriz, a significant differentiation in the methods of the human's description can be seen. The heroes of the poems and then the paintings become more abstract. By replacing individual ideas with philosophical thoughts, the artist gets away from the concrete thoughts more than ever. Thus neglecting the individual personality of the human spreads. We may recognize here some specific criteria for portraying the kings and important people. In the meantime, the sample hero either in the battleground or in the court scenes is incarnated with his weapons, often with a great physique and a beard, but without the peculiar characteristics that are indicative of a particular physical strength. And the addressee of the work is able to estimate the hero's power just through considering the expressive signs of motions. The soldier is pictured while he has picked up his sword or he is cutting off the enemy's neck or he is fighting with a demon or a giant dragon. While this pitched battle, according to the text, ends with success of the hero [17]. In general, traditional arts, including Persian painting, are kind of apocalyptic vision of the world intended to connect the essence of the temporal existence of man to the eternal truth. In Islamic art, the soul and soil interaction considered to be an axiomatic principle.

In the art of painting, the man's dual substance associates another disjunctive theme of proximity and estrangement. A human who lives, fights and dies, is always a stranger who tries to conjoin his origin. This idea leads to a conscious movement; or you may say a sacred journey. The utopian abstract human of the Persian painting is an embodiment of this travel. In visual epic narratives, including the miniatures of the Shahnameh, the hero's humanistic character embodied in a structure, influenced by philosophical ideas of Shi'ism. Here the hero is apparently a different personage from the mythical and epic hero the performance of which needed different signs. There is a special and different interpretation and definition of the human being in any idea of faith. The human is the addressee, as well as a part of the theme of the art. The myth, the epic and mysticism are related to experiences and aspects of human worlds.

The mythology, according to its first editors, has been carrying a sacred content. That means it has had mystical and theological content or has contained a kind of cognition which relates human to the Gods. A myth is a symbolic fiction of adventures which the seeker deals with on his spiritual journey. All the elements, in this realm, have allegorical roles for expressing the process of interior journey of the seeker. In this semantic realm, the myth is a sacred tale of the seeker's interior journey. For example, the battle between the heroes of Iran and Transoxania points out a metaphor of the war of heavenly forces of the psyche against the corporal powers of the self. There seems a story of the battle of the Gnostics against the evil powers [16].

The Iranian world, which is geographically located between the subcontinent and the Arabic world, is the country of Zoroaster, Suhrawardi and Hafez. This land is a scene of the combination of all kinds of wonderful ideas connecting that of Zoroaster and Plato as of Abrahamic traditions. In this world, the Zoroastrian religion has become the circle of brotherhood and chivalry and the ancient heroic Persian epic has become a mystic full of emanative stories of the Islamic period.

The mystical vision of the human being

Human as the vicegerent of God: According to the Holy Quran, God has created the man as a trustworthy successor for him: "And when the Lord said unto the angles: Lo! I am about to place a viceroy in the earth..." [33].; "Lo! We offered the trust unto the heavens and the earth and the hills, but they shrank from bearing it and were afraid of it. And man assumed it" (Ibid, 33/72).

The man became the most noble of all creatures through his acceptance to the speech of "Am I not your Lord?" ["And when thy Lord brought forth from the children of Adam, from their reins, their seed and made them testify of them: Am I not your Lord? They said: yeah..." (Ibid, 7/172)]. By the advent of the human, the sacred effusion emerged and God appeared.

The human lives in the world as the interface of the earth and the heaven, and as the vicegerent of God from a unique origin and center. This means the viceroy of God presented subsequently by traditional man of the Persian painting, the hero of the miniatures is different from the epic hero who lives in a dualistic universe with the endless struggle of Ahura and Ahriman.

The traditional man, being aware of the origin of the life, possesses a central reflection of life. According to Islam, human considered as being the exclusive vicegerent of God and the protector of the earth as long as he is loyal to the eternal covenant and aware of his duty takes his way of fulfillment. The man's statues- as a mediator between earth and heaven- seem fated fallen on the earth. The perfect man, who as the first exemplar of the creation mirrors the Divine names and attributes, is a human archetype[20]. The destiny of a human, a spiritual wayfaring for his fulfillment joins hereby the earth and the heaven toward an eternal unity.

The mystical relation of the man and the world

The world is a unit created by God. The visible multiplicities disclose his names and traits. Ibn Arabi, the great Sufi mystic (1165- 1240 A.D) says: The world was not completed until man came into existence [21]. In Sufism, the overall levels of being named as the five Devine existences in which the bodily world included, as well as the realm of imagination, the intelligible world, the realm of Divinity and finally the station of uniqueness. According to mystical view, the rise of man happens in the realm of Divinity first and for this reason he can experience annihilated in God while achieving the supreme unity; then it happens in the heavenly realm and at last on the earth with his mortal earthly body.

The man as is shown in mythology reflects the basic plan of the world and his concern about world depicted in the myth of the sacrifice of the first human. In Zoroastrian Persian mythology the sacrifice of the first man- Kumarth- is related to the creation of the world, and different parts of his body relate to different levels of the creature, like animals, plants and inanimate objects [21]. God -the Absolute good-is the Creator of universe and man, yet while the universe is intrinsically good, it also appears as a battleground for good and evil. The man considered to be a confederate of god so performs increasingly his religious duty through self realization of goodness, although he is free to make a choice between truth and falsehood.

A human, who must be good as a whole, accordingly in the ideas of Shi'ite and Sufism, represented as a special creature, an indivisible component of the great united system of the creation, travels toward God through universal system. This discipleship is based on the Islamic religious law by which the creation of human and world matched together [31]. According to the mystical tradition, the first man is an archetype of the creation so regarded well an example of perfection. In Muhammad Divine tradition, Allah says to Mohammad (peace be upon him), who is essentially considered the highly transcendental creature the light of whom appeared first: "I didn't create the world unless for you". The human -the microcosm- and the universe- the macrocosm reflect each other like two mirrors. The prophet Mohammad says that Allah has created the human in the form of God. However, this concept applies only for the perfect man who is single apparently but, united with the universe [20].

The perfect man

Any human can be considered as perfect man potentially but the prophets and saints are actually perfect. The human being essentially is perfect, but all the human beings are not the same and there are levels. The primordial nature of man deserves to be the transmitter of the revelation to the world forming the noble paradigm of the spiritual life. According to Shi'ism, the world will never be empty of the perfect man to perform worship of God perfectly so His grace is the means of achieving high spiritual stations of human beings. Following the path of perfection is not possible except through the guidance of the perfect man who is a surmounting friend of God [22]. In his *Fusus Al-Hikam*, Ibn Arabi said that the unity with God means being- qualified by Divine attributes in a manner understood as attending the five Divine transcendental stages by which exemplified the perfect man[23].

In his book- *Mersad el-ebad*, Najmuddin-e Razi- the Persian Sufi of the 13th-century has mentioned some essential attributes for the perfect man such as: knowledge, faith, wisdom, generosity, courage, modesty, patience, good mood and glory. According to Attar of Nishapur- the Muslim Persian poet and theoretician of Sufism (1110- 1221 AD), the perfect servant of God must go through the steps in order to leave illusory and sensible, which is the stage of lust and covetous desires; also has to be over with the intellectual

concept which is a source of pride; while he must forbear the nonexistent which is the source of fraud in order to achieve the unity and the perfection and the vicegerency of God [4]. Meanwhile according to illuminative philosophy, a human is a microcosm and a God's manifestation and if he removes physical appearances and effects, he will be the God's vicegerent and the God himself. Nasir al-Din Tusi, the Persian Muslim philosopher, says: The human perfection and his virtue are from his thought, sight, and intellect in order to shine upon him the lights of Divine commandment therefore becomes near to the high heaven and the plane of divinity (1968: 31). According to the Mysticism, in general views anyone can become a real luminous (Utopian) human by acetic arrangements.

The Utopian human in epic and mysticism

The ideal or godlike man is a symbol of supernatural power who would realize in heroic stories his nation's dreams by the extraordinary actions. The Persian ideal human is the symbol of the moral individualities of the Persian Utopian nationalism. His Idealism is limited to the borders whereas his world-view is based on scarifying oneself for the sake of nation. But the perfect man of mysticism doesn't know a range called homeland means he is from the country of the soul. The epic ideal man is a servant of God nevertheless the ideal mystic man has a romantic quality. The perfect man of the epic represents an extroverted being whose objective world is the nature, the battlefield and the castle's ceremonies- the characters that can't be examined by a dissociable mystic hero. Whereas the perfect man of the epic transfigures in the face of kings and heroes yet his glory comes from the material powers; the perfect man of the mysticism is expressed seeming like prophets and saints whose greatness comes from the spiritual sources. The epic ideal man is rationalist, but the mystic perfect man believes in love too. The epic man is a hero in contrast to the enemies; the mystic man is also a hero in contrast with the devil and the impulsive soul. The epic man relies on the divine glory and the mystic man on the providence. Whereas the first believes in the phoenix, the oracle and the magic the second man relies on miracles. The sensuous is important for the epic man, but the mystic man passed them. Both of the epic and mystic heroes have been two great men in two stages of the history of the cultural development. The first stage occurs in the ancient Iran whereas the second belongs to the period of Islamic culture during the evolution of Islamic Sufism.

The mystic hero

According to the Christian, Jewish and neo-Plutonian gnosis and mystic anthropology of Suhrawardi, a human on one hand is terrestrial while on the other hand a numinous. In this sense the numinous champion is synonymous with the word of chivalrous and hero [32]. According to the mystics, a human being has both a putrefying body as well as a spiritual bright body. The body itself is a temple; the sacred place where the Divine presence makes its appearance [24]. In Zoroastrianism, the wrestling belt has an allegorical meaning. They thought that the devilish pollution can only reach up to the man's waist and a believer is pure and providential from the chest up. So the wrestling belt defines the boundary of the pollution and the purity [25]. The battle between gods and demons presents also a parable of the contrast between good and evil desires of the human. The cosmetic battle is a war which any human being has to do it inside him to drive the evil out of the world of God. Such an interpretation of the mythological and epic battles between good and evil, would lead to a discussion that can be founded as a mystical epic.

The mystical epic

The illuminati have made the mystical epics from the Persian heroic epics begins a period of allegories in which an interpretive method is used in the case of the great heroic figures. By doing this the heroic acts of the epic champions have become sacred somehow. Suhrawardi turned an athletic event into a mystical experience [26]. Through his illuminationist wisdom, he looks into the story of Zal and the battle of Rostam and Esfandiar in a mystical way. According to him, the birth of Zal and the death of Esfandiar are codes of two important events in the history of the soul; means the descent of the soul on the earth and her process of ascent to the source. He considers kings and heroes as mystics. And he interprets the phoenix, world-viewing cup and angles as the inner guides. Thus the hero's actions happen in a different existential realm. This causes the heroic epic leading finally to the mystical epic.

Aziz ad-Din Nasafi- a Sufi of the 7th century as we mentioned his name earlier- believes that the world is made from two mixed seas of the light and the darkness and it's the perfect man who separates this light from the darkness completely [25]. The mission of every mystic or hero is to return to a world where he belongs. The illuminists interpret the Shahnameh through the hidden vision by linking between the mystical thought of return and the related heroic actions [26]. The transforming of the heroic actions into a mystical story requires an intermediate world which is called the spiritual realm. Incidentally, the spiritual realm is the same placeless and timeless atmosphere of the Persian paintings. Here it can be interpreted that the heroic and epic images of Persian paintings are embodying mystical epics in somehow colorful mysterious illustrations.

The hero-Philosopher

In his book "The Proposals", Suhrawardi talks about the Persian sages or the Royal sages and the great tree of sagacity. He threatens Kumārth- the first mythological king of Iran- as a Pahlavi sage. Then he mentioned Fereydoon and Keykhosrow and the royal sages and leads this series to himself through three masters of the Sufism- Bayazid Bastami (804-874 AD), Mansur al-Hallaj (858-922 AD) and Abul-Hassan Kharāqāni (963- 1033 AD). Keykhosrow is a heroic king and a sage whose magic cup is considered as a microcosm or a mirror and decoder of the world. He is the cause of the transition from the heroic to the mystical epic. According to Suhrawardi, all of the ancient Persian heroes have been contributed in a spiritual destiny. He has a mystical interpretation of the heroic characters of the Persian epics. Meanwhile, he distinguishes a synonymy between the champions, the knights and the kings of Shahnameh on one hand and the mystics' hidden hierarchy, means the Saints, the Substitutes and the Poles on the other hand [26].

He came to the holiness and received the Divine grace through meditation, isolation, thinking and righteousness. In the end, he withdrew from the reign and ascended to the heaven to maintain the lordly light [25]. If this royal wisdom is the throne, its carpet will be another kind of wisdom which can be called the heroic wisdom. These two types of wisdom are distinct, so that the heroes lag behind Keykhosrow in the end; but the nurturing of prince Siyawash by Rostam the athletic shows that there is a connection between these two kinds of wisdom. One would say Siyawash as a martyred, is the heavenly face of Rostam. As Keykhosrow takes the path of isolation and prayer himself, but advises the heroes to have fun [6].

The wayfarer hero

The mystic's journey is passing through the existential circles and ranks, from the creation to the truth and from the truth to the creation. In this interior journey, a mystic passes through the seven cities of love in order to join to the eternal perfection of the Divine essence, but unlike him the epic hero has an external journey in the time and place to rise to the heroic status. He has to go through tough experiments. The seven exploits of the hero are a reminiscent of seven steps or passageways, as like as the seven levels of the Mithraism remind us the seven steps of the sacred journey of the Sufis. A hero goes through the seven exploits apparently with a goal similar to that of the mystic journey, but in a different way. The epic journey starts from the physical world to the soul and the mystic journey begins from the soul to the material world. The hero's battle is against the fate, the nature, the enemy and the demon which can be an associative of the stages of the soul as myatic endeavors among different levels of existences [27].

In recent times, the mystics have interpreted the seven exploits of Rostam and Esfandiyar as the seven realms of the spiritual wayfaring (the request, the unification, the knowledge, the independence, the love, the astonishment, the annihilation) or the seven practical steps of the mystical path (the self, the nature, the breast, the heart, the secret, the hidden, the most hidden) [28]. Also in Mithraism, it was obligatory for the beginners to pass seven hard experiments, because it is so believed that the man's soul has been infected seven times when it has come down from the heavenly position to the material world, so it has to be purified in seven stages[6]. In the final analysis, the epic seven exploits of human traveling to the death and his rebirth has been apparently associated with the ceremony of the hero's intuition to the mysterious semi-epic and semi-mystical ceremonies. In the Shahnameh, this is represented as the hero's pass through the seven exploits in order to save the king or his family from the enemy or the demon [29].

The heroism and the rules of chivalry and generosity

From the late Achaemenid period till the end of the Parthian era, the Zorvanists had underground temples which were similar to modern gymnasiums. The temples of Mithraism were also like them. In these temples the followers have been raising their body and soul to reach to the stage of the master which was a spiritual and heroic station. The championship and chivalry were not limited to the reinforcement of the body but also included personality, cognitive and moral dimensions. Traditionally the heroism has been a moral-cognitive system and an educational manner which combined with the Sufism later. The link between the heroism and the mysticism is an ancient connection and the transition from the heroic to the mystical epic is a feature of the Persian culture. The chivalry, which is a sign of the doctrine of the spiritual generosity in Islam, is an official of the Sufism and an expression of the spiritual ideal of the heroism in the Islamic society. But it goes further and seeks to regulate a sacred ritual for all professions. The initiation of chivalry takes place through a ceremony and turns into a spiritual tradition in which every traveler is a chevalier; a person whose spiritual power has been activated. Also the allegiance means the eternal covenant with God. The chevaliers appeared in the tenth century AD. They were the same as the heroes of the past who had traveled from the materiality to the spirituality. Even in later times, the Sufis, such as the first generations of Muslims, participated in the holy wars and the distribution of Islam in other countries; then converted to this saying of the prophet Mohammad: "We have succeeded from the minor holy struggle, now it's the time for the major holy war". The minor or lesser holy struggle is the war against the non-believers and the major or greater holy struggle is against the concupiscence. The mentioned speech of the prophet implies the essence of the transition from militarism to spiritual bravery and chivalry. In Futtowat-Nameh (the book of chivalry), Vaez Kashefi (1436- 1506 AD) says that the saints are followers of

the prophets in one hierarchy the founder of which is Abraham whereas Imam Ali considered to be as its Great pole and Imam Mahdi as the seal of it. So the idea of chivalry after converting to Islam totally depends on Shi'ism. From the chivalry's view, the mission of the prophets and the leadership of the Imams and the Saints reflected in the system of heroism and knighthood fun [30]. Seventy two moral conditions is mentioned for the chivalry, including kindness, honesty, goodness, virtue, loyalty, Generosity, humility, wisdom and piety. In general the spiritual figure of a chevalier reminds us the heroic attribution of the national epics. According to the absolute dominance of Shi'ism inspired the Persian thoughts, the heroes of Persian paintings introduced in the visualization of the chevaliers or the heroes of the mystical epics.

DISCUSSION

In this research, the features of some types of the heroes- mythological, epic and mystical- were studied analytically according to Persian literary references- specially the Shahnameh (the book of kings) and the stories of Suhrawardi. The results are briefly as follows; there are some differences among mythological and epic and mystical views of the Persian painters about the heroism. A Mythical hero is a Superman or a Demigod who has overcome the personal limitations, leaves the normal life and travels on a dangerous path and finally achieves the victory. The epic hero is a seeking fame superman who fights for the honor of nation, the character of whom is based on the duality and the contrast of the good and evil.

There are conflicts associated with the hero include these items: the opposition of the name and shame, the power and the wisdom, the war against the love and the conflict of the reality and the hyper-reality and also included the contrast of the magic and the destiny. Fighting for revenge and going through difficult experiences a hero carried with himself a horse, armor, a wand, a sword and a bow and some other weapons, the Divine grace, the fortune, the wisdom and the chivalrousness accompanies the hero this battle. In terms of mysticism, the hero is somewhat different and his depiction requires different signs. In the realm of mysticism, the myth or the epic is a story of the inner journey of the wayfarer and the hero's battle is an allegory for the war against the impulsive soul. In this world view, the human being is a vicegerent of the Divine, a mediator between the heaven and the earth lives while been aware of the unity of the universe embodied as the perfect man. In this way, the hero is a visual embodiment of the ideal human of mysticism or the perfect man. The heroic actions have sacred aspects in a way that the features of hero could be interpreted in the manner in which his wisdom as the Lordly wisdom and his charisma as the light of the supreme being of the Divine. The experiences and the heroic seven exploits associate the mystic journey and the seven steps of the perfection. Thus, in the mystical literature and Persian miniatures, the heroic regulations are linked with the Islamic chivalry which is rooted in Sufism. The Muslim chevalier resembles a hero of the faith and owns ancient moral principles combined with the Abraham's tradition, the Shi'ism and the Sufism.

CONFLICT OF INTEREST

There is no conflict of interest.

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REFERENCES

- [1] Eliade Eliade M. [1993] Patterns in Comparative Religion. Translated to Persian by: Satari, J, Tehran: Soroush.
- [2] Hiniez J. [2005] Understanding the Persian Mythology. translated to Persian by: Amoozgar, J; Tafazoli, A, Tehran: Cheshmeh.
- [3] Campbel J [2006] The hero with a Thousand faces. Translated to Persian by: Khosrowpanah, Sh. Mashhad: Gole-Aftab.
- [4] Razmjoo H. [1996] The Ideal and Perfect Man in the Persian Epic and Mystical literature. Tehran: Amirkabir.
- [5] Maskoob Sh. [1974] An Introduction on the story of Rustam and Esfaindiar. Tehran: the Pocket Books.
- [6] Moazan-Jami MM. [2000] The Heroic Literature- a Study on the Ancient Persian Literature since Zoroaster to Parthian Era. Tehran: Qatre.
- [7] Kazazi M. [2001] Labyrinths of the Secret: Studies in Shahnamehh. Tehran: Markaz.
- [8] Zarinkoob A. [2004] The Significant Letter: About Firdausi and Shahnamehh. Tehran: Farzan.
- [9] Safa Z. [2005] The Epic Literature in Iran, Tehran: Amirkabir.
- [10] Sarkarati B. [1978] "The Mythological Foundations of the national Persian epics". In: Understanding the Shahnamehh- collected Speeches of the First Scientific Conference of Shahnamehh. Tehran: Shanameh Institute. 70-120.
- [11] Zomorodi H. (2003). A Comparative Study of the Religions and the Myths in Shahnamehh, Khamseh of Nizami and Mantıq-ı-ı-Tayr, Tehran: Zavar.
- [12] Coyajee JC. [2004] The Foundations of the Persian Myths and epics, Translated to Persian by: Doost-khah, J. Tehran: Agah.
- [13] Ferdowsi A. [2006] Shahnamehh. Tehran: Rouzaneh.
- [14] Rastegar Fasayi M. [2002] Firdausi and Iranian Identification. Tehran: Tarheno
- [15] Eslami Nadoushan MA. [2006] Life and Death of the Heroes in Shahnamehh. Tehran: Enteshar.
- [16] De Fouchécour CH, others. [2002] The Hero's Body and the Wise Soul (new research on Shahnamehh). Tehran: Tarheno.

- [17] Poliakova V, Rahimova N. (2002). The Persian Paintings and literature, Translated to Persian by: Feyzi. Z, Tehran: Ruzaneh.
- [18] Hanzen CH. [2005] The Shahnameh of Firdausi- the Structure and form. translated to Persian by: Jahandari, K. Tehran: Farzan.
- [19] Pakbaz R. (2001). The Persian Painting from Ancient Times until Today. Tehran: Zarin & Simin.
- [20] Nasr H. [2006] The Knowledge and the spirituality, translated to Persian by: Rahmati, E. Tehran: Sohrevardi.
- [21] Hekmat N. [2007] The Theosophy and Art in the Mysticism of Ibn Arabi (the Love, the Beauty, the Confusion), Tehran: Farhangestane Honar.
- [22] Motahhari M. [1970] The Friendship and the Sainthood: the Vicegerency and the Sanctity according to Quran and the tradition, Tehran.
- [23] Burckhardt, Titus. [1995] An Introduction to Sufi Doctrine, Translated to Persian by: Ajand, Y. Tehran: Moula.
- [24] Nasr H. [2004] The Knowledge and the Holy, translated to Persian by: Haji-Mirzaee, F. Tehran: Farzan.
- [25] Razi, H. [2000] The Royal Theosophy: The Illuminism and Mysticism from Zoroaster to Suhrawardi. Tehran: Behjat.
- [26] Shaigan D, Parham B. [2006] Henry Corbin: the Horizons of the spiritual thinking in Persian Islam. Tehran: Farzan.
- [27] Maskoob Sh. [2002]. The Fortune and the Work of the Hero in the Seven Exploits, Tehran: Tarheno.

ARTICLE

THE IMPACT OF RELIGIOUS-SPIRITUAL ATTITUDES ON MARITAL SATISFACTION AMONG COUPLES IN DISTRICT 7 IN SHIRAZ

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ABSTRACT

Background:The main objective of the present study was to explore the impact of religious-spiritual attitudes on marital satisfaction among couples in District 7 in Shiraz. **Methods:**To this end, a survey method was administered on 100 persons who were selected as the respondents through cluster sampling. The collected data were analyzed using Pearson correlation coefficient. **Results:** The results indicated that there is a significant relationship between religious-spiritual attitudes and marital satisfaction, to the extent that the higher such attitudes, the higher would be the marital satisfaction among individuals. **Conclusions:**Accordingly, it can be suggested that spiritual attitudes are among factors that plays a significant role in marital satisfaction.

INTRODUCTION

KEY WORDS
Religious-spiritual
attitudes, marital
satisfaction, marriage

Everybody must have a goal and direction in his life. There is no doubt that life would be meaningless if there is no such a goal. One of the purposeful stages in life is marriage and family is considered as one of social foundations and a factor that paves the way for the community's and the future generation's mental health. Family as a social unit is characterized by the most profound human relations. In addition, it is considered as the primary source for meeting individuals' basic needs and provides multiple opportunities for learning and forming attitudes and believes. In addition to its educational and behavioral functions, family plays a significant role in meeting physical and psychological needs and transferring social values. It is in the family context that a person learns the community's expectations and this awareness helps him to pick up certain behaviors [1]. The family health is dependent on the stability and the health of the relation between partners and the marital relationship makes up the core of the family system. Therefore, an individual's satisfaction with the marital relationship shows his/her satisfaction with family. Marriage is seen as one of the most important and valuable components in the human life. Through marriage, two persons are attracted to each other through an instinctive force and they become committed to one another freely and thoroughly to form a dynamic institution called family [1]. Family is a holy and serene environment and as it is described most elegantly by the holy Quran as a place for real peace and relaxation [2] and every community can survive and maintain and extend its values through family.

The most important point in explaining the philosophy of marriage in Quran is that when God was mentioning the rationale of marriage and family formation he does not refer to the reason for creating partners, human survival, having decent children, preventing corruption, promoting moralities, or developing Islamic attitudes, but he refers to a reason without which the goals of human creation cannot be realized and this reason is mental peace. Without mental peace, one cannot be expected to possess piety and when there is no piety there will be no decent children and no ethical and social development and thus religious values and monotheistic ideals cannot be developed [3]. According to [4] a person who is going to marry expects that his/her life be accompanied by happiness, bliss, and satisfaction in all moments of his/her life. Therefore, a thing that is even of higher significance than the marriage itself is the success in marriage or, in other words, couples' satisfaction. The main mission of the husband and wife is to achieve the highest goal of marriage that is to attain stable peace and relaxation. Marriage is the most natural response provided to the human's instinctive need for internal security and peace of mind. Marital satisfaction is one of the most important determinants of the health function of family [5]. [6] defines marital satisfaction as "an objective feeling and pleasure, and the couple's enjoyment of all their relations. Marital satisfaction is affected by different factors such as partners' mood, trust, loyalty, and love, and the partner's income and employment [7]. God has created human being as the noblest creature and blew his own spirit into human body. Therefore, there is a great difference between human and animals; in the sense that human is a two-dimensional creature while animals are one-dimensional creatures. Human and animals have some commonalities in terms of their basic material needs and what makes human distinct from animals is his spiritualism. The reason is that if the human body is destroyed, his spirit will remain stable. A person whose spirit dies turns into a dangerous being not only for himself but also for the society with his destructive effects being appeared in the family. Therefore, one of the most important needs is the need for spirituality in the family. Since the two institutions of religion and family focus on similar values, researchers predict a close relationship between them. This orientation supports the view that religion can strengthen marital relations [8]. Religious attitudes can affect the marital relations because religion provides guidelines for human life and form a system of beliefs and values that can influence the marital life [9]. On the other hand, the family members' attitudes towards religion can ensure the stability and transfer of religious values and behaviors to future generations. Therefore, religion and family can be considered as affecting and being affected from each other.

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Marriage is the first step in forming a family. The family starts with a marital bond and its stability and survival is dependent on the stability and the strength of the marital relationship. Although a satisfactory marriage is one of the important factors affecting the mental health of the community, if marriage and family life result in unfavorable conditions for satisfying couples' psychological needs not only the mental health is not realized but also it leaves negative and irreparable consequences which lead to nervous disorders, depression, and suicide as outcomes of family conflicts. According to Wiseman, Sheldon, and Goering, most psychiatric disorders including physical, cognitive, and behavioral disorders and depression have their roots in marital chaos. According to [10] research, marital dissatisfaction and divorce can result in physical and mental disorders among couples. In addition, it is suggested that the marital dissatisfaction can lead to children's delinquency and the community may be harmed by unhealthy families [11]. These problems have made humans to seek solutions and find out components of marital satisfaction.

According to findings from various studies, couples report almost high levels of marital satisfaction at the beginning of their marriage. However, the signs of dissatisfaction appear in many cases in the early years of marriage and the decreased levels of marital satisfaction are associated with high risks of divorce, so that a large number of marriages results in the early years of mmm relation, especially during the first seven years and this has caused a high divorce rate [5].

Iran is not an exception and a glance at the reports provided by the Organization for Civil Registration in Iran shows that the divorce rate during the last five years has grown by 37%, with most cases of divorces occurring among couples under 30 years old. In addition, 84000 cases of divorce occurred in 2005 and this increased to 137200 cases in 2010. These figures indicate that the divorce rate has increased over 53000 cases during a time period of five years and experts success different reasons for it. In simple terms, 84000 cases of divorces in 2005 increased to 94000 cases in 2006. The corresponding values in 2007 and 2008 were 99852 and 110510, respectively, showing an 11% growth. This upward trend increased to 137200 cases in 2010 which is considered as a strange record. In fact, the divorce rate has had a 37.59% growth during this five year period. On the other hand, regardless of all marriages that end up in divorce, there are many instances of unsuccessful marriages where the couples are not willing to get divorced for different reasons [12]. Nevertheless, marital conflicts regardless of whether they end up in divorce or not are associated with reduced physical and mental health, helplessness, reduced joy, dissatisfaction with the shared life (Knock, 1995), depression, anxiety, obsession, coercion, problems in physical and mental health among couples [1].

Islam considers family as the most basic social unit which is based on affection, sympathy, and companionship and it is the most popular foundation before God. Family relations are founded upon love and compassion and the family warmth is attended deeply by Islam.

Islam lays the foundation of family life on rights and responsibilities with each member having defined roles and functions. At the same time, it considers the forgiveness and altruism on the part of both parties involved in the marital relationship as an essential factor for the stability of the family. According to Islamic teachings, reforms must be started from families and Muslim people must establish their social life based on the family.

Family is a system that has been developed by God, the creator of human, who is aware of all delicacies and subtleties of his life. God also seeks happiness and satisfaction for human beings and there is no error and lapse in what he does. As a result, misery and helplessness is useless for human beings and there are all prerequisites accessible the establishment of real peace and relaxation among couples.

MATERIALS AND METHODS

Population, sample, and sampling method

The research population included all people living in Region 8 in Shiraz. The research sample consisted of 100 members of the population who were selected through cluster sampling.

Instruments

1. Spiritual attitude scale

This scale contains 43 items based on a five-point likert scale. The face validity and content validity of the scale were assessed and confirmed through surveying 19 professors. The reliability of the scale was measured by administering it to 40 students using test-retest method within a five week interval and its reliability index was reported equal to 0.61. Then the scale was administered to 235 students at Shahid Beheshti University and two factors (spiritual attitudes and spiritual ability) with eigenvalues of higher than 5 were determined using rotational Varimax. In addition, internal consistency of the scale was calculated through Cronbach correlation with a value of 0.91. Based on these results, it can be said that the Spiritual Attitude Scale has an acceptable level of reliability and validity and can be used as a suitable tool in research on spirituality and spiritual development. The scale was developed through the following steps: First, the general issues and aspects about the existence of spirituality among individuals were assessed using the literature on spirituality and spiritual intelligence and focused groups. The following aspects were identified: 1) Meaning and goal in life, 2) spiritual experience, 3) spirituality and religion, 4) altruism, 5)

focus on supernal and spiritual dimension, 6) characteristics of spiritual humans, and 7) the effects of spirituality. Each item in the scale was scored using a five-point likert scale (0 = Strongly disagree, 1 = Disagree, 2 = Moderately agree, 3 = Agree, and 4 = Strongly agree).

2. Enrich marital satisfaction questionnaire (Enrich-47)

Enrich Marital Satisfaction Questionnaire (Enrich-47) was developed by [13] to assess problematic areas and identify strengths and constructive aspects of marital relations. This questionnaire has been used as a valid research instrument in many studies to measure marital satisfaction.

The questionnaire contains 115 items and it is also available in another form with 125 items. It enjoys strong psychological features (Arnold & Min, 2004). The internal consistency of the questionnaire has been estimated in a range from 0.73 to 0.90 (Olson & Olson, 2000). The reliability of the questionnaire was assessed through Pearson correlation coefficient and test-retest method and the resulting values for males and females were 0.93 and 0.94, respectively (Mahdavian, 1997; cited in Sanaei, 2000). In addition, the validity indexes for its subscales including Family satisfaction and Satisfaction with life were measured through correlation test and the resulting values were 0.41-0.60 and 0.3200.41, respectively, showing its internal consistency. All subscales make a distinction between satisfied couples and unsatisfied couples and this shows that the questionnaire has high criterion validity (Sanaei, 2000). Favors and [13] found that the questionnaire is able to distinguish happy married couples from unhappy married couples with an accuracy of 85% to 95%.

Enrich marital satisfaction questionnaire scoring

The questionnaire items are scored using a five-point likert scale (0 = Strongly disagree, 1 = Disagree, 2 = Undecided, 3 = Agree, and 4 = Strongly agree). Items 1, 2, 3, 5, 7, 9, 10, 17, 25, 26, 28, 29, 33, 34, 36, 43, and 44 are scored reversely. Table 1 shows how different subscales are scored by summing up the related items:

Table 1: Scoring of subscales

Subscales	Items
Contractual response	1,2,3
Marital satisfaction	4,6,7,8,9,10,11
Personal issues	22,31,40
Marital relation	13,32,41
Conflict resolution	14,24,33,34,42
Financial management	15,16,25
Leisure activities	17,16,25,43
Sexual relations	17,25,26,43
Marriage and children	19,27,37,45
Relatives and friends	20,29,38,26
Gender equality	5,12
Ideological orientation	21,30,39,47

The total scores obtained through administering the questionnaire are interpreted in the following way. A score below 30 shows the partners' extreme dissatisfaction with marital relations. Scores within the range of 30-40 show the partners' dissatisfaction with marital relations. Scores within the range of 40-60 suggest that the partners are moderately satisfied with their marital relations. In addition, scores within the range of 60-70 show the partners are highly satisfied with marital relations. Finally, the scores in the range of 70 and higher indicate that the partners are extremely satisfied with their marital relations.

Procedure

First, a total number of 100 persons were selected in District 7 in Shiraz through voluntary sampling and the researcher informed them about the objectives of the study and how they were required to answer the items in the two questionnaires. Then, the two questionnaires were distributed among the respondents and they were asked to answer each item honestly. Finally, the responses to the items in questionnaires were scored and the collected data were used for statistical data analysis.

Data analysis

The collected data were analyzed in this study using descriptive statistics including mean and standard deviation of the research variables and inferential statistics including Pearson correlation coefficient through SPSS Software (Version 21).

RESULTS

Descriptive statistics for research variables

This section presents the descriptive findings of the study that include mean and standard deviation for the variables under study, as shown in Table 2. As it can be seen, the mean score for *spiritual attitude and ability* is 128.83 with a standard deviation of 18.03 and the mean score for *marital satisfaction* is 116.06 with a standard deviation of 31.58.

Table 2: Descriptive statistics for research variables

Variable	Mean	Standard deviation
Spiritual attitude and ability	128.30	18.03
Marital satisfaction	31.58	116.06

Table 3: Hypothesis testing results

Variable	Marital satisfaction	Spiritual attitudes
Correlation	1	0.469
Sig.		0.001
N	100	100

N = 100 p < 0.05

As it is shown in the above table, the significance level between the two research variable is smaller than 0.05 ($P < 0.05$). Therefore, the null hypothesis is rejected and the alternative hypothesis is retained. This suggests that there is a significant correlation between spiritual attitudes and marital satisfaction. In addition, as the correlation value equals 0.469 ($r = 0.469$), it can be suggested that there is a positive relationship between the two variables. This is to say that as spiritual attitudes increase there will be an increase in marital satisfaction.

CONCLUSION

The results of this study showed that spiritual attitudes are among factors that plays a significant role in marital satisfaction. This is also supported by the religious teachings as the life become peaceful and serene when a person does not forget God and his blessings and banquets and always seeks the divine satisfaction [14]. In such cases, God endows with a clean life to the spouses [15]. If the spouses obey God's commands he reforms their reactions and the more they adorn themselves with the divine obedience and worship [1], the more likely they will be to remain safe from God's wrath and ensure their happiness in the world and hereafter [3].

This finding can be explained in the light of the fact that religious commitment contributes to improving and strengthening relationships among couples and facilitates the performance of religious duties. It also helps parents to come into an agreement about child-rearing practices and at the same they are able to establish good relations with their children. This also enables the partners to follow a common philosophy and goals in their life. Secondly, religious commitment helps individual to spend their free times with their families and have a suitable planning in this regard. Thirdly, religious commitment enables individuals to accept differences in other people's tastes and adopt themselves to these discrepancies accordingly. Besides, people are enabled to establish good relations with their relatives and friends and attach a high importance to visiting relatives on a regular basis. Fourthly, such a commitment helps couples to resolve their disputes more effectively and have a plan for managing their income and expenses. Finally, people with religious commitment are more satisfied in their sexual relations [16]. The results of the present study also indicated that the couples' affinity in their adherence to religious rules and teachings can affect their marital satisfaction. Other studies also found couples' similarities in religious beliefs, faith, and piety can play a significant role in their success in the shared life [1].

CONFLICT OF INTEREST

The findings of this study do not lead to conflict of interest for beneficiaries, readers, and general population it focused upon. Besides, personal gain is not sought or achieved by the author or the affiliated university.

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REFERENCES

- [1] Ahmadi K, Fathi-Ashtiani A, Navabinejad S. [2005] Individual, contextual, and relational factors influencing marital adjustment. *Family Research*, 3(4):221-237.
- [2] The holy Quran, Surah Rome, Verse 21.
- [3] Pasandideh A. [1389] Family consolidation in the view of Quran and Hadith. Qom: Dar al-Hadith.
- [4] Bradbery TN, Fincham F D, & Beach S R. [2000] Research on the nature and determinants of marital satisfaction: A decade in review. *Journal of Marriage and Family*, 62(2): 967-987.
- [5] Greef AP. [2000] Characteristics of families that function well. *Journal of Family Issues*, 21(3): 948-962.
- [6] Ellis A. [1989] Rational-emotive couples therapy. New York: Bergamon press.
- [7] Blum JS, Mehrabian A. [1999] Personality and temperament correlates of marital satisfaction. *Journal of Personality*, 67: 93-125.
- [8] Call VRA. & Heaton TB. [1997] Religious influence on marital stability. *Journal for the Scientific Study of Religion*, 36: 382-392.
- [9] Hunler OS , Gencoz TI. [2005] The effect of religiousness on marital satisfaction: Testing the mediator role of marital problem solving between. *Journal of Psychology Research*, 4(3): 55-73.
- [10] Sappington A. [1998] Mental health. Translated by Hossein Shahi Baravati, H R. [2000]. Tehran: Ravan Publication.
- [11] Heidari M. [2003] The relationship between religiosity and marital satisfaction in family of male teachers in Qom. Master thesis in psychology. Qom: Imam Khomeini Education and Research Institute.
- [12] Website of Organization for Civil Registration [2011].
- [13] Olson DH, Olson AK. [2000] Empowering couples: Prepare/enrich program. *Marriage and Family: A Christian Journal*, 3: 69-81.
- [14] Mjlesi MB. [1995] Bihar al-Anwar. Tehran: Daralokotob Islamiyah.
- [15] The holy Quran, Surah Nahl, Verse 97.
- [16] Mir Ahmadizadeh A. [2003] Marital satisfaction and the factors affecting it in Shiraz. *Thought and Behavior*, 8(4): 56-63.

ARTICLE

THE EFFECTS OF ORGANIZATIONAL AGILIZATION ON SPIRITUAL INTELLIGENCE AND EMPLOYEES EMPOWERING IN ZAHEDAN'S EXECUTIVE AGENCIES

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ABSTRACT

Spiritual intelligence, a human-specific feature connecting him to the transcendental world, is a dynamic intelligence, enabling people to be creative, break the rules and alter routine functions. The more science and techniques develops through the time, letting new demands and challenges to show up, the organizations become more complex, requiring stronger management strategies. The present study is a survey on the effects of organizational agilization on spiritual intelligence and employees empowering at executive agencies in Zahedan, capital of Sistan-Baluchestan Province, Iran. The research is descriptive-survey, which is carried out through filed observations. All 2260 staffs at Zahedan's executive agencies served as statistical population. Using Krejcie and Morgan Table, sample size was calculated to be 331 employees. Data collection was carried out through questionnaires. The instrument's validity was examined through qualitative face validity and content validity. In addition, the internal consistency reliability of the questionnaire was calculated using Cronbach's alpha. The alpha coefficient for organizational agilization was equal to 0.93, while the figure for the employees' intellectual intelligence was 0.92 and employees empowering got the alpha value of 0.89. The analyses showed a significant relation, between the components of organizational agilization (speed, competence, responsibility and flexibility) and two other variables including spiritual intelligence and employees empowering, in error level of 0.01. Inferential analysis of results, in comparative analysis part, showed the effect of agilization on employees empowering was merely significant- in error level of 0.05- with regarding the age and working experience of the research population. Furthermore, the effect of agilization on employees' spiritual intelligence was only significant is only significant- in error level of 0.01- with regarding gender difference among the population, highlighting stronger effect on females than the male staff. Finally, employees' spiritual intelligence effect on employees empowering was 0.019 (0.12 for direct effect plus 0.07 for indirect effect). The organizational agilization variable directly affected employees empowering by 0.53. In addition, employee's spiritual intelligence variable had the total effect of 0.019 on employees empowering (0.12 for direct effects and 0.07 indirect effects).

INTRODUCTION

In today's turbulence world, success and efficiency is owned by people who are gifted higher IQ level, making them mentally powerful enough to handle life challenges. Similarly, in the world of organizations, this is also the case. The more science and techniques develops through the time, letting new demands and challenges to show up, the organizations become more complex, requiring stronger management strategies. State-of-the-art technology information and production lead to agile production; and agile production consequently leads to organization agility through decrease in expenses, increase in speed and quality. Hence, responsibility and flexibility, as a result of effective interrelation between top brasses, employees, suppliers and customers, has a close connection with agility [1]. Normally, due to certain rules and frameworks, organization does not fulfill organization agility and speed, negatively affecting employees' job satisfaction. Therefore, one of the agile organizations objectives is to increase employees' job satisfaction, which would definitely end in output quality improvement [2]. Numerous studies have proven the positive effects of spirituality on success. Results of such studies maintain that spiritual values not only contribute improving employees' life quality, but also it is potential enough to promote the whole system [3]. Modern rushed world today is extremely relied on intelligent, agile organizations in order to take approving measures towards adjustment with the world outside, in case of urgent unexpected incidents.

Problem Statement

In the present time, organizations face fast-changing working environment, impelling them to choose among alternatives and adjust to the new situations. Quick technical revolutions, high risk, globalization and privatization, shape working-environment surrounding organizations. To survive in such condition, numerous solutions have been suggested, such as re-engineering, net production, Total Quality Management (TQM), and employees empowering. Organization agility is one other solution, emphasized by researchers in recent decade. As a management-related concept, organization agility born in a (specifically flexible) production system background, later permeating through wider business fields, as one of the organizational features [4].

Lean et. al., has provided a conceptual model for organization agility based on the relevant literature. Regarding the proposed model, an agile organization is aimed to enrichment of and fulfilling demands of

KEY WORDS

Organizational
agilization, spiritual
intelligence, employees
empowering, Zahedan

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customers and employers, and change, which is the most substantial agility provocative element. This change is often observed in customers' demands, market, competition criteria, technology and social elements. To curb the changes, one agile organization requires a set of abilities (flexibility, competency, responsibility and speed) for example. The most essential pre-requisite for achieving to an agile organization is to revise and modify approaches, to react against technologies and working facilities. Various abilities should be created and strengthened to take appropriate measures and actions against ever-changing environment situation [5]. The present research is to investigate the effect of organizational agilization on spiritual intelligence and employees empowering in Zahedan's executive agencies, after an insight to the relevant theoretical and experimental literature. The research findings would finally suggest strategies for promotion and development of organizational agilization, spiritual intelligence, and employees empowering. The effects of organizational agilization on spiritual intelligence and employees empowering has not been carried out so far. However, the importance and necessity of implementing such research studies in Sistan-Baluchestan Province is clear. The results of the study could be later applied to executive agencies in the province.

Theoretical background and review of the literature

Based on the review of the related literature, no researcher has so far worked on the presented topic: effects of organizational agilization on employees' spiritual intelligence, although each variable has been numerously investigated separately and in relation with other factors. Furthermore, the Amram research results proved that spiritual intelligence significantly affects the efficiency and success of career management [6]. However today, empowerment attracts less attention of the researchers than the last decade. Maybe the reason is that empowerment, as a strategic structure, is comprehensively practiced in the world today and is rarely challenged. The concept of empowerment has numerously examined and analyzed, every time showing a strong relation between human behavior and its capability structure [7].

Agilization

The origin and base of agility is agile manufacturing, which is a concept spreading among producers who are ready for noticeable operational boost, as an accepted strategy, every time offering successful results. In such a working environment, each organization would be labeled agile organization, if it is potential enough to simultaneously produce different types of goods with short lifetime, redesign products, change production methods and practical reactivity against changes.

Researchers and scholars have presented various categories of indicators and requirements of organizational agility [8]. In fact, agility requires a great power to conceive, receive, observe, analyze and predict fluctuations in company's surrounding world. Accordingly, an agile producer could be considered as an organization, owning a wide scope on modern world economy regulations, making best of its limited abilities and power against the chaos in surrounding world, grabbing beneficial opportunities. Longian argues agility is the ability of a business to survive and progress in a competitive environment, in which changes happen unexpectedly and non-stop. Adding to the definition, he said agility is quick reaction to ever-changing markets, majorly influenced by customers' evaluation of products and services.

Spiritual intelligence

The concept of intelligence was first introduced in 1905, by Alfred Binet, ancient French psychologist and Hermann Theodor Simon, German physicist. Although there is a rich study literature and numerous scientific theories on intelligence, the scholars are yet stuck in discord over the definition of multiple dimensions of the concept.

There are several definitions of spiritual intelligence, all emphasizing on learning from failure, meaning and objectives in work, self-consciousness, creativity and organizational development. In contrast to logical intelligence, enjoyed by computers for instance and emotional intelligence, observed in some mammals, spiritual intelligence is specific to human. Sisk (2008) maintained spiritual intelligence as multi-functionality in problem solving and learning, together with listening to the inner voice. In other words, spiritual intelligence is a deep consciousness, informing human of his inner dimensions. The power make then understand their world inside, developing the concept that human is not merely a physic, but also is a combination of body, mind and soul.

Empowering

The first definition of employees empowering dates back to 1788. It explains the concept as assigning tasks or functions in an organization, which should be compatible with the role and function of the assignee in the system [9]. The history of using the concept of empowering in management is rooted in industrial democracy and involving employees in organizational decision-making, presented over time by terms team creation, cooperation and comprehensive quality management. Based on the latest

modifications, the term an employee empowering has been introduced for the concept. Literally, employee empowering is giving power and freedom of action to people to manage themselves, and in organizational context, empowering means modification of culture and boosting brevity in creation and navigation of an organizational environment. In other words, empowering means to design and built an organization, in a way that people could be able to accept more responsibilities, besides controlling oneself. Empowering clever, hopeful, right, and reliable employees creates situation, in which they can control and develop their professional life, growing to accept heavier responsibilities [10].

Relation between variables and hypothesis analysis

a-research main hypotheses

Organizational agilization is positively effective on spiritual intelligence and employees empowering in Zahedan's executive agencies.

b-research sub-hypotheses

- 1) Organizational agilization is positively effective on spiritual intelligence of the employees in Zahedan's executive agencies.
- 2) Organizational agilization is positively effective on employee empowering in Zahedan's executive agencies.
- 3) The employees' spiritual intelligence is positively effective on employee empowering in in Zahedan's executive agencies.

Research conceptual model

After reviewing theoretical and experimental background of the study, the conceptual model of research was presented as the [Fig.1] below.

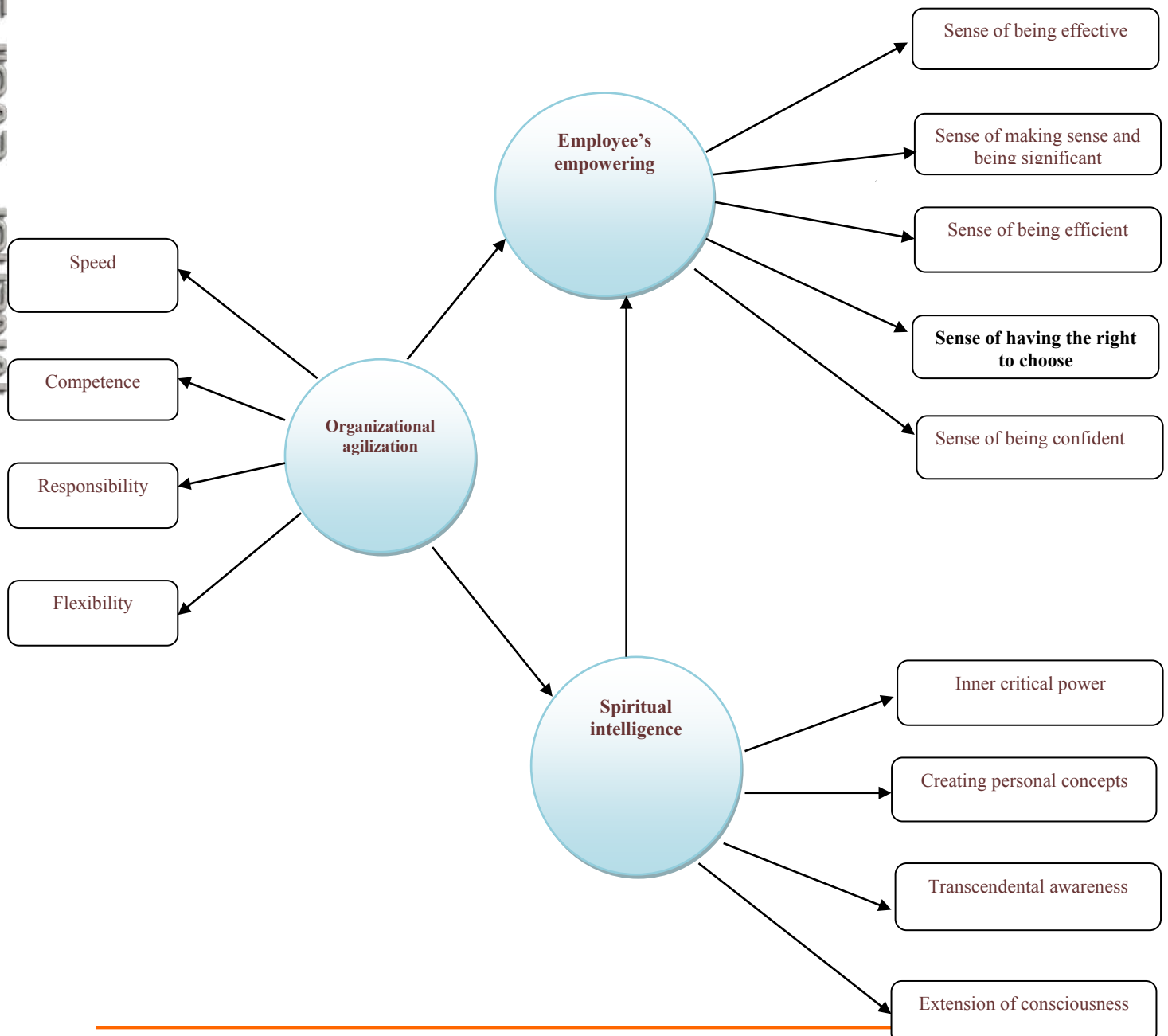


Fig. 1: The Effects of Organizational Agilization on Spiritual Intelligence and Employees Empowering.

MATERIALS AND METHODS

The present study is descriptive- correlation, in terms of type and field study, in terms of data collection. All the employees working for 16 executive agencies in Zahedan in 2015, which is equal to 2260 people, serve as study population. The sample size was calculated 331 employees using Krejcie and Morgan Table (1970), through stratified sampling technique. The objects were first divided to different categories based on variables- like the type of executive agency they work at, job level, and gender- and then, regarding the size of each category, basic sampling method was implemented for each category separately. The reliability of the questionnaire was calculated using SPSS software and through Cronbach's Alpha formula [Table 1]. To determine validity of the instrument, content validity was considered. To gain the acceptable validity and fulfill the required relationship between questionnaire's items, the questionnaire was discussed over, investigated, revised and approved by relevant authorities and experts, after carrying out initial studies over the topic.

Table1: Validity and reliability of research variables

Variable type	variable	Dimensions	Reliability Alpha value	
			Dimensions' alpha value	Total alpha value
Depended variable	Employee's empowering	Sense of being effective	0.79	0.93
		Sense of making sense	0.93	
		sense of being efficient	0.87	
		Sense of having the right to choose	0.89	
		Sense of being confident	0.87	
	Spiritual intelligence	Inner critical power	0.86	0.92
		Creating personal concepts	0.74	
		Transcendental awareness	0.84	
		Extension of consciousness	0.92	
Independent variable	Organizational agilization	flexibility	0.86	0.94
		responsibility	0.82	
		competency	0.80	
		speed	0.90	

ta analysis

a-descriptive analysis

Using SPSS software, the obtained data went through descriptive analysis like comparing frequencies, percent's and average values of factors age, gender, academic level, job level and years of working experience.

b-inferential analysis

According to the fact that both variables organizational agilization and spiritual intelligence of employees in executive agencies of Zahedan city were determined and calculated using interval scale and the hypothesis was proposed in correlation pattern, the research statements was examined and investigated through bivariate regression analysis.

[Table 2] shows bivariate regression analysis of two variables organizational agilization and spiritual intelligence of employees in executive agencies of Zahedan city.

Table 2: Bivariate regression analysis of two variables organizational agilization and spiritual intelligence of employees in executive agencies of Zahedan city

variable	Employees' spiritual intelligence	
	Results of bivariate regression analysis	
Organizational agilization	R correlation coefficient	0.11
	Beta	0.11
	T-Test significance level	0.036
	Number of subjects	331

[Table 3] presents the bivariate regression analysis of variables organizational agilization and employee empowering in executive agencies of Zahedan city.

Table 3: bivariate regression analysis of variables organizational agilization and employee empowering in executive agencies of Zahedan city

variable	Employee empowering Results of bivariate regression analysis	
Organizational agilization	R correlation coefficient	0.54
	Beta	0.54
	T-Test significance level	0.000
	Number of subjects	331

[Table 4] presents the bivariate regression analysis of variables employees' spiritual intelligence and employee empowering in executive agencies of Zahedan city.

Table 4: The bivariate regression analysis of variables employees' spiritual intelligence and employee empowering in executive agencies of Zahedan city

variable	Employee empowering Results of bivariate regression analysis	
Employees' spiritual intelligence	R correlation coefficient	0.18
	Beta	0.18
	T-Test significance level	0.001
	Number of subjects	331

Based on the data provided in [Tables 1 to 4], it can be understood that the organizational agilization and employees' spiritual intelligence have a significant effect with the error level of 0.05. Beta value for the relation is 0.11, positive and direct. This indicates that the variable organizational agilization determines and controls 0.11 of variance and changes of the variable employees' spiritual intelligence in executive agencies of Zahedan. The analysis determines that with the development of organizational agilization, the spiritual intelligence of employees in executive agencies strengthens. Therefore, accordingly, the first sub-hypothesis of the research (the significant positive relation between organizational agilization on employees' spiritual intelligence) is confirmed.

The variable spiritual intelligence and employees empowering have a significant effect with the error level of 0.01. Beta value for the relation is 0.18, positive and direct. This indicates that the variable spiritual intelligence determines and controls 0.18 of variance and changes of the variable employees empowering in executive agencies of Zahedan. The analysis determines that with the development of spiritual intelligence, the employees empowering in executive agencies strengthens. Therefore, accordingly, the second sub-hypothesis of the research (the significant positive relation between spiritual intelligence on employees empowering) is confirmed.

[Table 5] presents the correlation matrix of factors of organizational agilization, employees' spiritual intelligence and employee empowerment.

Table 5: The correlation matrix of extracted factors from organizational agilization, employees' spiritual intelligence and employee empowerment

Factors	speed	competency	responsibility	flexibility	Inner critical power	Creating personal concepts	Transcendental awareness	Extension of consciousness	Sense of being effective	Sense of making sense
speed	1.000									
competency	0.662	1.000								
responsibility	0.556	0.630	1.000							
flexibility	0.517	0.685	0.721	1.000						
Inner critical power	0.176	0.078	0.106	0.130	1.000					
Creating personal concepts	0.112	0.004	-0.002	0.022	0.611	1.000				
Transcendental awareness	0.040	0.041	-0.009	0.064	0.568	0.604	1.000			
Extension of consciousness	0.119	0.109	0.032	0.192	0.366	0.448	0.566	1.000		
Sense of being effective	0.347	0.420	0.389	0.366	0.162	0.229	0.101	0.124	1.000	
Sense of making sense	0.306	0.239	0.256	0.166	0.207	0.252	0.079	0.064	0.438	1.000
sense of being efficient	0.249	0.229	0.263	0.233	0.162	0.220	0.152	0.009	0.469	0.686
Sense of having the right to choose	0.382	0.495	0.420	0.501	0.094	0.038	0.037	0.122	0.570	0.137
Sense of being confident	0.304	0.396	0.389	0.441	0.061	0.005	-0.001	0.117	0.392	0.124

As it can be seen in table 5, there is a significant correlation between organizational agilization, employees' spiritual intelligence and employee empowering, all being in the level of significance equal to 0.01.

CONCLUSION

Generally, after bivariate analysis, it is clear that the main research hypothesis, saying that organizational agilization affects spiritual intelligence and employee empowering in executive agencies of Zahedan, is supported. The variable organizational agilization and its factors have a significant effect on employees' spiritual intelligence in the executive agencies of Zahedan on the error level of 0.05. Beta value for the relation is 0.11, positive and direct. This indicates that the variable organizational agilization determines and controls 0.11 of variance and changes of the variable spiritual intelligence of employees in executive agencies of Zahedan. The analysis determines that with the development of organizational agilization, the employees' spiritual intelligence in executive agencies strengthens. Furthermore, the variable organizational agilization and its factors have a significant effect on employee empowering in the executive agencies of Zahedan on the error level of 0.01. Beta value for the relation is 0.54, positive and direct. This indicates that the variable organizational agilization determines and controls 0.54 of variance and changes of the variable employee empowering in executive agencies of Zahedan. The analysis determines that with the development of organizational agilization, the employee empowering in executive agencies strengthens. In addition, the spiritual intelligence has a significant effect on employee empowering in the executive agencies of Zahedan on the error level of 0.01. Beta value for the relation is 0.18, positive and direct. This indicates that the variable spiritual intelligence determines and controls 0.18 of variance and changes of the variable employee empowering in executive agencies of Zahedan. The analysis determines that with the development of spiritual intelligence, the employee empowering in executive agencies strengthens.

CONFLICT OF INTEREST

There is no conflict of interest.

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REFERENCES

- [1] Crocitto M, Youssef. M. (2003). The human side of organizational agility. *Industrial Management & Data Systems*, 103(6):388-397.
- [2] Robbins, S. P. (2005). "Principles of organizational behavior". Publisher: Oxford University Press. ISBN: 0199253978. p.752.
- [3] Gardner H. (2000). "A case against spiritual intelligence", *The International Journal for the psychology of Religion*, 10
- [4] Hardy Cynthia, Leiba O, Solivan Sharon, [1998] the power behind Empowerment: Implications for Research & practice, *Human Relations*, 51:(40).
- [5] Torng Lin, C,et.al . [2005] Agility evaluation using fuzzy logic, *Int .j. Production Economics*, PP.1-16. [6]-Amram, Y. (2009). "Intelligence beyond IQ: The contribution of emotional and spiritual intelligences to effective business, 27-34.
- [6] Haight KW. [2011] Teacher self-efficacy in the adoption and integration of technology within the classroom. Thesis Degree.
- [7] Bowel RA. [2010] The seven steps of spiritual intelligence, translated by: Daramadi P.; Navidi Moqaddam M.; Hosseini, S.; first print, Qom: Bakhshayesh Publication
- [8] Wilkinson, B. (1993). *The Shop Floor Politics of New Technology*. Heinemann.
- [9] Qasemi, Sh, (2011), identification and analysis of effective factors on agility of Bank Melli staff in Sanandaj County, MA thesis for Azad Islamic University, Sanandaj Unit.

ARTICLE

INVESTIGATING CULTURAL AND SOCIAL SUSTAINABILITY IN RENOVATION AND DURABILITY OF VERNACULAR BUILDINGS OF IRAN'S ARCHITECTURE

(CASE STUDY: BAZAAR OF TABRIZ)

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ABSTRACT

Each part of built space or each architectural urban unit has the ability to reflect specific concepts and meaning regardless its form and size. Existence of meanings and concepts in architectural space becomes dense where richer culture gets involved in forming space. Investigation and recognition of cultural symbols and signs existing in physical form of cities contribute to identification and determination of special values concepts which were common among people. Sociocultural connections determine values of community. Urban spaces as a component of city construction have a particular performative pattern; they involve a part of social and cultural society and have a mutual relation to them. The main objective of this paper is to reach interaction among culture and social relations and architectural- urban space that cause an increase in people's positive participation and presence in these spaces and consequently, promoting sense of belonging to a place. The results show that some architectural spaces with their indigenous and old form have been successful to meet modern human's social and cultural demands in regard with change in people's needs during several decades; and request for seriously noticing vernacular architecture leads to cultural and social sustainability.

INTRODUCTION

Cities are now considered as one of the most tremendous achievements of culture and civilization and one of the most comprehensive social phenomena today [1] . In last decades, discussion of sustainability in cities have been argued as important global issues due to importance of urban life. It is mentioned in a definition of sustainable development that that this development means promoting life quality along with supporting environment [2] .Dimensions of sustainable urban development include environmental and economic and social dimensions. In environmental sustainability, conservation of natural sources is concerned and it is fulfilled through environmental and territorial sustainability. The first one is related to natural ecosystems and the latter is related to examination of spatial distribution of human activities and form of town-village. In economic sustainability, efficiency of economic systems (foundations, policies and functional regulations) is concerned more greatly and widely and therefore, it guarantees quantitative and qualitative progress and social equity. Social sustainability includes dimensions and results of social sustainability and also cultural sustainability [3].

Notion of sustainability initially was defined in global and national scales and then, it was highlighted in city and local communities RENA . This approach change over scale was in favor with frontline sections in local development. Meanwhile, notion of culture was regarded as a crucial part of sustainability process. Although discussion about culture was offered in a restricted term, it had a major influence on writings and researches on sustainability. In scope of local communities' development, cultural considerations initially were raised often in realm of discussion on social sustainability or social capitals [4] . Considering architecture of Iranian cities, its commercial structure had been located in the middle of city as a monolith integrated set. Bazaar is regarded as central trade restrict of today's large cities. This space with Iranian roots in different historic eras indicates each city's progress in economic, social, religious, cultural and architectural urbanization aspects so far. Moreover, tourist industry is one of today's beneficial industries having a significant effect on economic growth of countries. No one is unaware of significance of this industry to national economy and attraction of foreign and native incomes. According to US Travel Association's comment, 62% of tourists prefer traditional bazaars while travelling; so after renewal of bazaars, these sets can be effective to import foreign exchange to the country.

Bazaar of Tabriz involves important elements such as religious centers, schools and trade markets like trade chambers, stores, stock of goods and caravanserais. This set contains 20 trade routes (rasteh) and bazaars, 35 serais, 25 timchehs, 11 dalans and about 8000 stores and 40 types of guilds. Bazaar of Tabriz is the only place in where commerce, religion, culture and social factors are integrated [5] .In this paper, it is aimed to analyze and investigate cultural and social sustainability and its related notions and therefore, to evaluate social and cultural sustainability in Tabriz bazaar based on social and cultural and economic criteria and to use this potential in development and improvement of urban space. In this article, research method is descriptive-analytic that is employed through obtained data from field and library research and related organizations.

KEY WORDS

cultural and social sustainability, renovation, vernacular buildings, bazaar of Tabriz.

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MATERIALS AND METHODS

Principles of this paper are fulfilled through descriptive-analytic research method and in terms of a qualitative study and it tries to answer the question that how effective cultural and social relations and basics were in durability of vernacular architecture.

Cultural sustainability

Sustainable development raised doubts about the lifestyle and decision making process based on consumerism merely in regard with economic efficiency and knows its moral infrastructures beyond environmental and economic requirements. In fact, sustainable development is a comprehensive and innovative procedure that always must have progressive attitude and cover [6]. This point that sustainable development is based on changing values and believes of local or global community makes it more complicated. Although culture is a significant dimension in models of environmental and social and economic sustainability, context and relation of culture have not been understood and recognized. According to proposed general definitions of different dimensions of sustainable development approach, specific faces and target of each dimension of sustainable development is expressed: in environmental dimension, focus on environmental resources and responsibility of conserving and preserving them lead to environmental sustainability; in economic dimension, focus on access to information and facilities is to fulfill justice and competitiveness; to achieve social sustainability, social justice and equity is focused; and finally, cultural sustainability approach focuses on cultural identity and it is aimed to achieve variety and distinction or in the other words, to achieve cultural diversity [7].

In spite of cultural sustainability importance, culture was traditionally some part of social dimension of sustainability or a part of social capital until last decade and it was not considered distinctively. For example as Mathio Pike [8] declares, while social capitals have been elaborately written about, but cultural capitals such as art of music, etc. and also other common values that are very important to make people closer have been far less regarded. Some part of this ignorance are due to lack of cultural considerations. Cities are also cultural artifacts. Many of them got artists, designers and architects employed to make them neat and turn them to happy life producers. This tradition is absolutely alive, too. Physical form of city is under influence of people's culture everywhere during the time. Behavioral values and methods affected by culture reveal when this cultural view is consciously expressed in form. Each cultural environment creates this space in accordance with traditions and obstacles and purposes followed in its moments of life, and social culture first plays key role in quality of its formation. Architectural space cannot be understood without recognizing its generating culture, and what is raised of this culture gets materialized after passing through contrivances and innovations; a material that is worked by human and to human and for human [9]. Social occasions are like blood flowing through vessels of city and its specific fabrics. Places are defined by social relationships not a piece of land [10].

Urban life utilizes past shapes as symbols and projections of political-ideological, cultural, economic and social notions. Art and culture have been mixed with cities for ages. Anthony Giddens addressed structure of this thought in term of a theory that social structures are resulted from mutual actions and connections formed between human and space. He has tried to propose a more accurate interpretation on quality of human behaviors concerning physical space by employing expression of "local place" [11].

Definition of culture

Today what is used in science a history of notion of culture is related to a new concept secreted gradually from different hidden meanings of an existing word. The word culture originates from classic Latin or pre=classic Latin and in fact, it used to mean cultivation or nurture. This word has been first used in this meaning about human societies in Germany since 1750. Although Tailor proposed the first scientific obvious meaning of this word in 1871, the definition propagated so slowly and finally, it was entered to encyclopedia and context in 1929 [12]. Study on culture, not as old as its history, has roots older than what is imagined. Society gets organized through culture and mankind becomes a social creature by culture. Culture is a tool for connection. If community is a system of connection, this connection is determined by culture. And also about connection, it is not reaction and contrary to something, but also it is interaction and exchange in which human creates its meaning to fulfill its targets and shares it with others. "Culture is an interlaced whole including knowledge, religion, law, moralities and all abilities and habits which human gets from society as a member", Duart Barnett Tailor said [12]. Culture is a set of believes, thoughts and human intellectual ideas that has provided base and continuity for human's growth and ascendancy and constituting a specific identity, or in the other words, it is all knowledge of a notion. Culture can be considered as a body whose essence has been formed through history of each community and many of physical changes are probable in it but its fundamental change is almost impossible [13]. Culture can be distinctive from society conceptually, but there is a close relationship between these concepts. "Culture" is related to lifestyle of a specific community's members- their habits and ethics, with material goods they produce. "Society" is described as an order of mutual links connecting people with a common culture. No culture can exist without society. Accordingly, no society exists without culture. Without culture, we would not be human with the meaning now is understood; we would have neither a language to express our purpose nor feelings. Our self-consciousness and thought or rationality would be so limited, too, [Table 1] [14].

Table 1: Different thinkers' definition of culture

Different thinkers' definition of culture	
Herskovits	1. Culture can be learnt. 2. Culture is structural. 3. Culture is dynamic and changing. 4. Culture is variable. 5. Culture is derived from biological, environmental, psychological factors and history of humanity. 6. Culture includes rules for analyzing it by scientific methods. 7. Culture can be divided into different aspect. 8. Culture is a tool helping person adapt its environment and create a way for its innovation [13].
Freud	He defines culture as: "Culture is a set of abilities and devices that differentiates our life from our ancestors' instinctive living and offers two purposes, protecting human against nature and adjusting human relationships among individuals" [15].
Dickson	Whole set of functions, customs and believes. A group's set of products and functions, religious and social order, custom and believes is generally called civilization.
Hiler	Believes, intellectual orders, scientific technics, lifestyles, customs and all methods of behavior organized by society are called culture. So definition of culture just include functions formed by humans' relations or learnt from another group but it excludes inherited behaviors.
Mead	Culture means an interlaced whole of relationship made and learnt by human. No culture can be limited. It can mean specific established behaviors of a society, one part of society, one specific scope or era.
Linton	Culture of a society is its members' way of living; they learn and share and transmit suspensions and customs from a generation to another.
Radcliffe-Brown	Cultural link process id reality of culture that it means a process in which language, believes, favorites, knowledge, skills and norms in a specific social group is transmitted from one person to another and from one generation to another.

Social Sustainability

Social sustainability means enabling all groups to possess essential needs including access to a rational and proper level of comfort; in fact, it concerns fair distribution of opportunities in fields of health and education [3]. Mark Roseland [29] argues that a sustainable society must be socially able to endure and produce based on its resources and sustain against future problems. Investigation of theoretical evolution process of social sustainability dimension indicates that at the beginning of raising this issue, till late 1980s, social sustainability was considered same as concept of social capital. Social capitals are sources based on relations, membership and network of social effects and supports. It is a set of material and immaterial resources allowing a person or people to have sustainable network of somewhat established relations of mutual acquaintances and recognition. Structure of social networks of individuals is another notion addressed in various forms in views on social capital. Creating a generative social capital emerges from networks. People make connections with others, obtain respect and confidence and understand social norms, values and targets. Networks also create commitment and reliance among members. Putnam considers a specific kind of helping norms as the most generative component of social capital and he even knows it as a criterion of social capital. In Bordio's view, cultural capital can act somewhat independent of material possessions and even compensate for lack of money [16]. In last decade, in UN conference on earth in Johannesburg with the subject of sustainable development and in consequence of local governments encouragements to propose their guidelines about sustainable development, social and cultural notions were respected [17]. However, developing writings and researches on sustainability have been represented in various fields including: Sustainable development, globalization, conservation of inheritance [18], sense of place, indigenous knowledge and traditional policies [18], cultural development of society, arts, education and the youth, sustainable design [18], planning [19], cultural policies and local government [7].

Cultural and social sustainability in architecture

Generally, culture can be known as product of human's different attempts in creation that originate from his freedom and will. Set of a community's etiquette, believes, opinions and traditions generally emerged innately and affected inside initially create culture. Main trend of idealism is based in cultures. Idealism underlies cultural worldview and adjusts its intellectual and theoretical principles; and these principles per se propose forms and terms in communities representing those infrastructures. Literature, art, religion, custom, tradition, etc. are channels to portray spirit of culture in a society and the argue is that are and among its seven foundations, architecture having a close relationship with culture as one of the main pivots to respond to human's need of shelter and built environment. Architecture is a social phenomenon originating from culture and affecting it and it is a mirror reflecting human thoughts in regard with space, aesthetics and culture. Each new civilization and culture starts from a point from which previous civilization and culture was halted or encountered crisis, but it contains and evolves previous and historic path and it reconstructs its structure merely in some steps. Therefore due to direct impact of culture in architecture, it is normal that changes in culture causes transformation in effective principles and concepts of architecture emergence and as a result, different architectural thoughts determining interaction methods generally between theoretical and cultural concepts and specially between theoretical concepts and architectural space raise. Orientation of culture is always done based on human nature and thought and this way is influential on forming environment and emerging architecture. Because this space is argued in regard with human nature's need and such needs are constantly required to be met in divine rationality and nature approach. So architecture should be concerned culturally before being focused as a technical specialty or art. Architectural space promotes based on cultural notions in time sphere and is expressed in dimension of place. One of artist's duties is to help ordinary people organize their cultural globe and in fact, artist must express natural signs more strongly and obviously for the public and remove obstacles for them. Old fabrics of cities constitute the most important and the most sensitive spaces of city as primary core. Study of each existing old space in an urban

environment in a specific historic era indicates human's demands to that space for working in that time. Study of urban fabrics shows ancestors and forefathers' culture showing their custom and tradition and lifestyle. These fabrics and buildings have been reflecting their society's progress and intellectual maturity for ages. Valuable existence of these old fabrics and current buildings inside them are cultural-social symbols and national monuments as well as constructed elegance and convey a spiritual load for posterity, and they are like contemporary city's heart that could not be adapted to revolutionary conditions and transition process. They have got fallen apart and time-worn due to these transitions and if this fraying goes on, there will remain no heart of city being able to beat perfectly and ideally in future; it is essential and urgent to preserve and take care of this existing old heart. Despite of abundant and comprehensive defects encountering historic regions, these areas possess many significant capacities due to age and historic values of these important buildings and considerable urban spaces. These capacities accounted in some scopes [Table 2]:

Table 2: Capacities of historic fabrics and buildings

Capacities of historic fabrics and buildings	
Historic facilities	A great number of valuable historic buildings provide various resort facilities and also a lot of valuable historic houses locating in historic areas that can be turned to new tourist facilities.
Functional facilities	There are lots of these facilities in historic areas because bazaar acts as economic urban core. Some buildings have national function in many historic areas.
Spatial facilities	Historic areas have the greatest spatial facilities. There are lots of rich buildings and courtyards that can be useful spatially for new urban and regional functions.
Economic facilities	Due to historic areas locating in city centers near thriving urban parts and in the middle of actions and activities of city, land price can be increased by specific measurements for accessibility and services. In addition, some facilities may be obtained by changing land use. For instance, building new commercial complexes, hotels, cultural and educational centers and so on [20].

Bazaar

In Persian, bazaar means a place for buying and selling goods, now it is mostly used about main, old, permanent bazaars of old and historic cities, though. In the past, this word whether as a simple term or as a prefix or suffix has absolutely meant place of selling and buying. The word bazaar has a broad and vast range of meaning in Persian literature and it was used as crowded and congested place, people's credit and importance, etc. [21]. The word bazaar can terminologically emphasize more on Iranian origins of this urban element [22]. Iranian bazaar has been popular through the world and globe trotters by its characteristics and Persian word of bazaar has been imported to many global languages. Architecture of bazaar depicts a noisy and varied image of different interlaced spaces of bazaar with vaults, arches and Karbandi's, an ambiguous and dusty light combined with different kinds of interior spaces of bazaar and lots of people passing through.

Sometimes, bazaar was a key element in constitution of cities and cultures as one of decentralized urban cores in term of an organic line in urban network; a body originated and originating in people's economic, social and climatic culture in each part of Iran, and one of identifiable or even identifying characters in our Iranian-Islamic culture. It was a central element for social, cultural, economic, religious events for centuries like a beating heart which was controlling city's pulse. Moreover, if there is a conversation about Iranian identity in architecture and urbanism today, minds concentrate on bazaar and it can be said that this urban set has turn to an identification of Iranian identity. Scent of apothecaries' bazaar and sound of impacts of coppersmiths' bazaar pacifies Iranian identity seeking spirit yet. Iranian cheer and happiness yet can be seen in shades of bazaar's geometry and motives. In Islamic era, city was interlacing around bazaars during transition and it was making new bazaars in its extension so that people were settling around them freely and a new neighborhood was created. Accordingly, bazaar can be known as backbone of city [23]. "Bazaar was the most important axis and connecting route in old city and most of citizens' traffic was through it. In the other words, bazaar was the most significant connecting channel of city through which people, goods and capital were flowing and also citizens were heard of information, news and notifications" [24]. Settlements economically relied on producing handicrafts and trade trace back to ten thousand years ago, but bazaar boomed in Seljuq dynasty and this urban set significantly soared in Safavid dynasty [21]. As mentioned, "Quality of defined and predictable behaviors introducing occasions of a place can be called culture of that place". People signify their environment by culture that means a set of values, believes, worldviews and common symbolic organizations and they change a meaningless space to a place [10]. Bazaar is visualized in terms of nuances on surfaces and volumes within cities in which density and richness of social and cultural relationships have been endured much longer. Spatial concept of bazaar is expressed by exchange between sellers and buyers. However, it may be called by another name if people do another activity there. Culture of bazaar is a term to define framework of encounters between citizens with each other in bazaar and indeed, this culture is different from culture of a lane or apartment living. Until some decades ago, definition of bazaar was under influence of cultural and social and particularly religious and political forces rather than economic forces. In fact, city's general culture was under influence of culture of bazaar rather than being effective on bazaar's occasions. Bazaar marketers' impressive social and political movements in Iranian Constitutional revolution are evidence for this claim.

Bazaar of Tabriz

Tabriz located along the Silk Road has been center of good exchange between the Far East and Europe for ages and many merchants and globe trotters have described its bazaars in their memories. "Ibn Batutah", the popular globe trotter who arrived in Tabriz in 731 AH declares: "Bazaar of Tabriz was one of the best I have ever seen in whole cities of world... I went to jewelry bazaar and gazed into various kinds of gems". In addition, Tavernier visited bazaar of Tabriz in 1046 AH and admired it [Fig. 1].

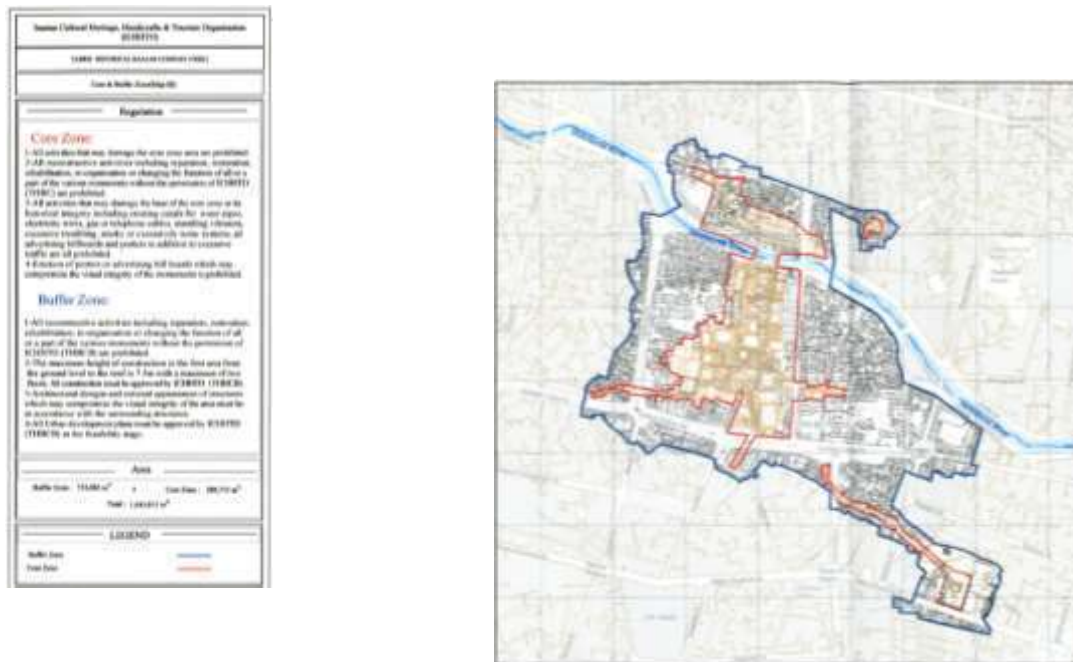


Fig. 1: Tabriz historical Bazaar Complex.

"Hamdolah Mostofi", popular historian and geographer in 8th century, in addition to describing abundance of cereals and fruits of Tabriz and referring to advantages of its specific kinds of pear, apple, apricot and grapes, introduced its people interested in trade whether poor or rich, and he remarked that there were lots of rich people there. Bazaar of Tabriz as a masterpiece of Iranian architecture (the largest covered bazaar of the world) was ruined in 1193 AH due to an earthquake, but it was reconstructed by people's attempts soon. Bazaar of Tabriz with 1 kilometer length is now the biggest roofed bazaar throughout the world that was recorded in the national heritage index in 1354. This bazaar has been turned into an excellent sample of business environment and Islamic and eastern life due to tall vaults and domes decorated with plaster works and motives, integrated brick structures, arrangement of stores, abundance of timcheh²s, different kinds of professions and lots of schools and mosques located beside these commercial serai³s. Dome of timcheh Mozafarieh is the biggest dome in this bazaar and timcheh Amir, timcheh Mozafarieh, timcheh Sikh Kazem, timcheh Gorjilar, timcheh Haj Safar Ali, timcheh Mirza Shafi', timcheh Haj Rahim, timcheh Haj Mir Abolhasam, etc. can be referred as the most important timchehs in this bazaar. There are temchehs, serais and chaharsoo⁴s in all these bazaars that their trade chambers and stores are wholesale centers for different foreign and native goods. Most of timchehs and serais are three floored, first floor is dedicated to maintenance of goods or stock in the other words, second floor is space for work and trade, and third floor is for rest. Although most of chambers in third floor of timchehs and serais have been turned to businessmen's offices now, but in the past with no vehicles available, merchants had to have an agent in trade places. That agent was resting in upper room of his store. So these timchehs and serais were both for work and rest.

Tabriz was developed through small bazaars alongside 8 old gates. Townscape was formed in last century through filling distances between small bazaars by residential units, and this townscape can be obviously seen in old neighborhoods now. Although old and traditional fabric has been eliminated by new streets, old architecture of city can be observed within old streets and alleys by some remained not-restored buildings. This part of city is limited to Dudechi restrict (Shams Tabrizi street) from north, Leilava and Charandab restrict from south, Seqat-al-Islam and Khaqani street from east and Rasteh Kucheh and Shariati street from west. Bazaar of Tabriz with total area of 1 km² is located within this central core that is constituted of timchehs and serais and dalan⁵s and mosques and baths and trade chambers. This bazaar has got damaged due to lack of attention since Iranian Constitutional revolution and 1300, particularly. Brunt of modern architecture and replacing old traditional materials by new ones

has threatened this bazaar. Recession after 1320s due to current political movements and exit of indigenous sources had a key role in devastation of Tabriz bazaar so that it reached a peak in decades of 30 and 40 due to lack of attention and most of damages to bazaar and its traditional fabric occurred in this period. However, if a European tourist wants to travel to east, he will not observe a roofed bazaar as huge as Tabriz bazaar from Europe to Tehran. Bazaar of Tabriz is one of amazing masterpieces of Iranian architecture. Its vaults and domes have wonderful muqarnas works. Cultural heritage of each country includes valuable and irreplaceable works belonging to that nation and the human being. Removal of these great works, whether for fraying or devastation, is damage in heritage of whole people around the world. Traditional bazaar of Tabriz was recorded in UNESCO list of registered heritage in 1389 as the largest roofed bazaar the world over [26]. Buildings of Tabriz bazaar trace back to late Zand dynasty [25]. Bazaar of Tabriz involves important elements such as religious centers, schools, and trade spaces like trade chambers, stores, stocks and caravanserais. This set has 20 routes and bazaars, 35 serais, 25 timchehs, 11 dalans and about 8000 stores and 40 types of guilds. Bazaar of Tabriz is the only place in where trade, religion, culture and social factors are integrated [26]. Most of traditional bazaars of Iranian cities are abandoned or semi-desert and they have lost their basic role, and in present urban spaces, their stores are not so attractive and often they merely concerned economically. In this centers, urban life does not exist and positive social interactions are performed [27]. But bazaar of Tabriz is active yet in spite of its history and social and cultural and economic works are flowing through it. Long routes of bazaar with vaulted and arch-shaped roofs have provided architecturally perfect coordination and unity throughout bazaar. This form is due to provision of a proper space for users as well as geographical and climatic aspects. Division of routes and continuity of passing paths create a dynamic space without bore. Routes and timchehs of Tabriz bazaar have played a vital role as cultural elements in Muharram occasions and Norouz celebrations and Islamic feasts. In fact, set of bazaar is similar to human body having proportions that each part performs its duty well. Numerous roles do not cause to lower quality of bazaar; it has created a balance that results in attraction and creating an efficient space for work and living. There is a harmony between human needs and type of arrangement in bazaar of Tabriz [Fig. 2].

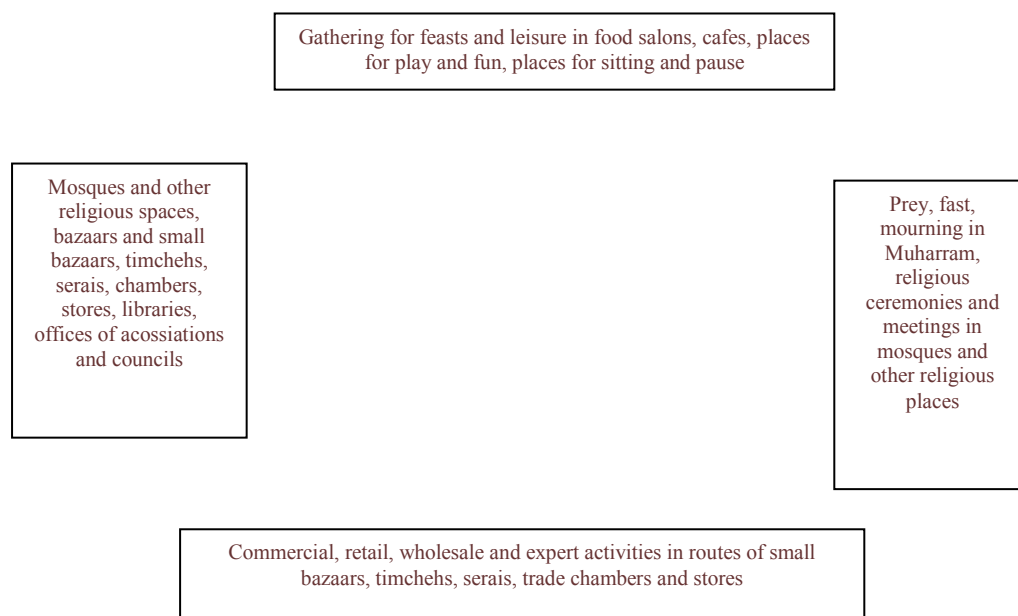


Fig. 2: The importance of Tabriz bazaar to economic, physical, cultural and religious [28]

RESULTS

Durability of elements of bazaar regardless all changes during their period refers to presence a social identity in this space, and this social identity includes 2 parts: Functional targets style or significance [29].

In the other words, these spatial connections in bazaar of Tabriz involve commercial uses as well as social issues as a tool for recognition and survival of cultural identity and creating sense of belonging. So bazaar is not merely an architectural body, it is affected by dominant social conditions. Bazaar is center of economic activity in cities and moreover, it has many social, cultural, political and religious functions that bazaar of Tabriz is an objective example of that.

Bazaar of Tabriz has been great center of informing socially-culturally inside city. Information and news was initially entered bazaar of Tabriz from all religious centers (like Jame' mosque), educational centers (religious schools), official centers (government center and courts) and other urban and non-urban centers. Bazaars often were closed while mourning for religious events or death of religious thinkers and famous people of city and mourning occasions were held mostly in serais or timchehs, and different guilds competed with each other for better ceremonies. Since Safavid dynasty, some groups of guilds hold mourning and religious ceremonies in serais and chaharsoos of bazaar every year on Muharram 10th; bazaar of Tabriz has been popular as center of

this occasions. Being roofed, it is also a place for fun and leisure. Bazaar of Tabriz can be mentioned as a space for living in present world (economic) and the other one (religious). In general, bazaars having variety of economic, social and religious functions are a perfect symbol of urban foundations formed during centuries; bazaar of Tabriz is active in these fields in current century and this unique feature has led to its survival and popularity of cultural and social identity and sustainability and durability so that lots people attend bazaar to do social and economic activities every day and they choose it to perform religious customs in different religious occasions and they accomplish cultural activities inside it [Table 3].

Table 3: The importance of Tabriz bazaar to Social ,economic, cultural and religious

Social	Economic	Social& Economic	Religious & cultural
ggggg. Sadiqiyh school yard	ccc. Misgar-lar Bazaari	Sāhib-ul-Amr-Meydāni (Square)	Sahebabad Mosque
hhhhh. Gurjilar Yard	ddd. Davachi Bāzārchāsi	Mahdie kārvānsarāsi	A kbaryiya School
iiii. Seyyd-Gulabi Hammam(bath)	eee. Yamanduz Bazaar	Kismiscilar kārvānsarāsi	Hasan-Pādishāh Mosque
jjjjj. Jahangirkhan Hammam	fff. Chārsugs Butchi	Gan-Dallazan Rāstāsi	Hāj-Safar-Ali Mosque & School
kkkkk. Mirza-Mehdi Hammam	ggg. Yakhchāl Bāzārchāsi	Mirzā-Shafi Dālāni	Ālchāq Mosque
lllll. Jafaryya Library	hhh. Sādeqiyya	Koochak Rāstā,	Imām-Jumā Mosque
mmmmm. Garshāseb Zorkhānāsi	iii. Bālā-Shāzdā Sarāyi	1. Tāzā-Rāstā-Bāzāri	Shahid-Qāzi Mosque
	jjj. Mirzā-Shafi Sarāyi	2. Butchu Rāstāsi	Mofid-āgā Mosque
	kkk. Bālā-Shāzdā Sarāyi	3. Sagatchilar Dālāni	Qizilli Mosque
	lll. Mirzā-Shafi Timchasi	4. Qumpān Dālāni i	Khāloglu Mosque
	mmm. Darabbāsi Sarā	5. Miyānā Dālāni	Hujjat-ul-Islām Mosque
	nnn. Mirzā-Jalil Sarāyi	Midqālchi Dālāni	63-Sutun Mosque
	ooo. Mirzā-Jalil Timcha	6. Khān Dālāni	ShishegarKhānā Mosque
	ppp. Malik Timchasi	7. Gānni Dālāni	Tālebieh School
	qqq. Javaria Bazaari,	Mirzā-Abul-hasan Dālāni	Dinavary Mosque
	rrr. Kechachi Sarāyi	Abāchi Dālāni	Khosroshāhi Mosque
	sss. Hāj-Rahim Timcha	8. Mozaffarieh intersection	Dinavary Mosque
	ttt. Hāj-Taqi Timcha	Gadim-Rāstā-bāzāri	Jafaryya Library
	uuu. Iki Gāpilār Sarāyi	9. Hāj-Sheykh Dālāni	Kalkatachi Library
	vvv. Kharāzilar Timchasi	10. Hāj-Ali-Akbar Dalani	Tālebieh School
	www. Haj-Husen-Gadim Sarāy	11. Sheykh-Kāzim Dālāni	
	xxx. Safi Bazaari	12. Birinji-Hāj-Abulqāsim Dālāni	
	yyy. Mirzā-Ismāeyl Sarāyi	13. Ikinji-Hāj-Abulqāsim Dālāni	
	zzz. Mirzā-Mammad Sarāyi	Safi Rāstāsi	
	aaaa. Kishmishchilar sara	14. Mirzā-Mohammad	
	bbbb. Sheykh-Kāzim Timchasi	Talischilar Rāstāsi	
	cccc. Boyuk-Sheykh-Kāzim Timcha	15. Sarrājān Rāstāsi	
	dddd. Hāj-Husen-Gadim		

	<p>Sarā</p> <p>eeee. Hāj-Safar-Ali Timchasi</p> <p>ffff. Hāj-Mammad-Quli Timchasi</p> <p>gggg. Hāj-MammadQuli sara</p> <p>hhhh. Gand-chilar Timchasi</p> <p>iiii. Safi Bazaar</p> <p>jjjj. Huseyniyya Bazaari</p> <p>kkkk. Hāj-Ali-Akbar Sarāyi</p> <p>llll. Hāj-Ali-Akbar Bazari</p> <p>mmmm. BādāmChilār Timchasi</p> <p>nnnn. Gurjilar Sarāyi</p> <p>oooo. TimchaGurjilar</p> <p>pppp. Bālā-Sheykh-Kāzim Timchasi</p> <p>qqqq. Shishegar Khānā bazaar</p> <p>rrrr. Mirzā-Mehdi Sarāyi</p> <p>ssss. Amir Sarāyi</p> <p>tttt. Bāshmākh-chilār Bazaari</p> <p>uuuu. Amir-Shumālī Timcha</p> <p>vvvv. Sajjād Sarāyi</p> <p>wwww. Amir Sarā</p> <p>xxxx. Amir Bazaari</p> <p>yyyy. Junubi Amir Timcha</p> <p>zzzz. Shishegar Khānā bazaar</p> <p>aaaaa. Haramkhānā Bazaari</p> <p>bbbbb. Sāhib- Divān Sarāyi</p> <p>ccccc. Ālmānli-lar, Sarāyi</p> <p>dddd. Angaji Bāzārchā</p> <p>eeee. Bālā-Sherbāflār Timcha</p> <p>ffff. Boyuk-Sherbāflār Timcha</p>	<p>r. Shahidi Rāstāsi</p> <p>w. Mabār-ul-Ulama Rāstāsi</p> <p>z. Gāni Dālāni</p> <p>y. Aghā Dālāni</p> <p>x. Sādeqiyya Rāstāsi</p> <p>aa. Yamanduz Rāstāsi</p> <p>bb. Dār-Dallazan Rāstāsi</p>	
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CONCLUSION

Urban life as physical symbol and visualization of political, intellectual, cultural, economic and social concepts utilizes all its past shapes. Art and culture have been combined with cities for ages. Bazaar was a central element for social, cultural, economic and religious events. It was just like a beating heart which was controlling city's pulse and it has been remained as an identification of Iranian identity. Scent of apothecaries' bazaar and sound of impacts of coppersmiths' bazaar pacifies Iranian identity seeking spirit yet. Iranian cheer and happiness yet can be seen in shades of bazaar's geometry and motives. Bazaar has always had a specific credit and value in Iranian culture. An element becomes endurable in human's mind while it is adapted to human's needs and features and it responds to them. Mankind is a sociable creature and constantly tries to be in an environment in which it can make connections and conquer it. Therefore, architectural environment indicates human's values, believes, etc. and it is like a mirror reflecting human's culture. So human always seeks for a compatible architecture to be integrated with it. Recent revolutions in architecture and urbanism have led to change in vernacular fabrics and buildings that are derived from defective and imperfect role of culture in transitions of urban spaces with no harmony with community. While bazaar of Tabriz is an urban space with potential to develop and it is a cultural and social wealth for Tabriz and Iran, noticing its renewal and concerning its original concepts to design and construct and develop today's urban spaces and fabrics highlight urban spaces and make modern and old spaces proportional and coordinated and increase people's attendance and social exchange and interactions and revive original urban culture and consequently, turn bazaar to a social and cultural place. Bazaar can be defined as a perfect mirror reflecting entire cases of historic identity of Iranian-Islamic architecture and urbanism that has been changed into an honorable document for the Iranian; an identifying and identifiable fabric that has been influential on exporting Iranian identity and culture. All spatial features related to human's mentality and sense of place can be observed in bazaar. All elements, from heat of bricks to the light entering space of bazaar through holes on roofs, accompany human and totally, human does not feel strange and it finds itself in the route and timcheh. Cheerful and vivid colors and organic materials of Tabriz bazaar have been revolved in accordance with human's values and believes during the time. As a result, bazaar of Tabriz has been focus of many cultural and social and political activities. Bazaar of Tabriz like other Iranian traditional buildings goes with human and its demands and norms and values rather than seeking for conquering mankind. Urban spaces can be more attractive and people's presence can be more highlighted in these places by recognizing traditional bazaars of cities and considering their original concepts in designing and building today's urban spaces.

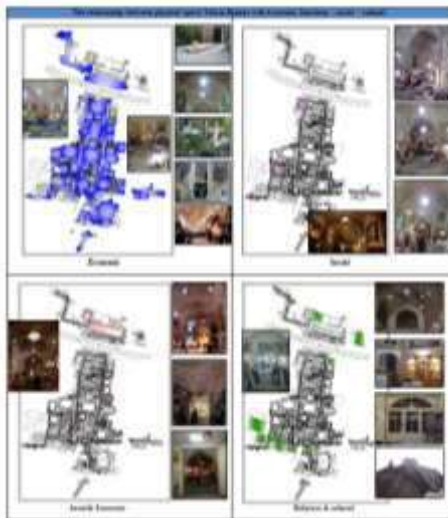


Fig. 3: Analysis of market Tabriz, Iran.

Artistic space of bazaar has created a particular relationship between function and social meaning of city that is the missing link in today's urban design. Historic fabric of Iranian urban bazaars have become old now and a great part of them has been devastated during the time. The important point is that devastation of bazaar is not related to economic power of guilds. One reason for wealth of bazaar may be hidden in its devastation! Wholesalers and retailers of bazaar dedicate demolished residential units and old caravanserais to their stocks and new craftsmen change devastated caravanserais and houses into manufacturing workshops. New incompatible materials and inappropriate spaces attached to old buildings have destroyed architectural quality and integrity of some part of bazaar. Irregular development of multi-story buildings (high-rise) in bazaar of Tehran has destroyed roof (vaults) of bazaar and replaced beautiful brick vaults with an inappropriate system of steel and asbestos cement sheets. These procedures occur while there is a claim to move towards identifiable Iranian-Islamic architecture and contemporary architecture is criticized because of lacking identity, but all are gazing devastation of this country's identifications; forms that can be the best teachers and samples of identity of Iranian Islamic architecture and urbanism. It should be concerned, as mentioned before, that one can be optimistic to promote physical level of bazaar by enhancing its qualitative level, though. But there is no guarantee that this situation will not happen again in future if original cultural and social level of bazaar is not reverted.

CONFLICT OF INTEREST

There is no conflict of interest.

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FINANCIAL DISCLOSURE

None

REFERENCES

- [1] Harvey D, [1376] Social justice and city", Hesamian et al, Tehran: Urban process and planning co.
- [2] World Conservation Union [1991] U.N, Environment program and World Wide Fund for Nature.
- [3] Assefa G, Frostell, B. [2007] "Social Sustainability and Social Acceptance in Technology Assessment: A Case Study of Energy Technologies", Technology, in Society, No.29, pp. 63-78.
- [4] Duxbury, Nancy, Gillette, Eileen [2007] Culture as a Key Dimension of Sustainability, Exploring Concepts, Themes, and Models, Creative City Network of Canada.
- [5] Zangiabadi A, Alizadeh J, Ranjbarnia B, [1391], "Strategic guideline to organazi traditional bazaar of Iran [case study: traditional bazaar of Tabriz]", Iranian Islamic city magazine, no 7, spring 1391: 13-26.
- [6] Newman Peter, Kenworthy Jeffrey [1999] Sustainability and Cities: Overcoming Automobile Ddependence, Washington, DC: Island Press.
- [7] SalehiMilani, S, Mohamadi, M, [1389] Purposes and indicators of fulfillment of cultural sustainability", Letter of architecture and urbanism, no. 5, fall & winter 1389: 81-98.
- [8] Pike Matthew .[2003] Can Do Citizens, London, UK: Social Enterprise Services & Scarman Trust.
- [9] Falamaki, M, [1371]. "Formation of architecture in experiences of Iran and the West", Tehran: NashrFaza press.
- [10] Torabi M, [1384], "Concept of city", AndishehArmanshahr, no. 6, winter 1384.
- [11] Mehdizadeh, J, [1383]. "Sociological theories in urban studies", Urban enquiries, no. 9, summer 1383.
- [12] Ashuri D, [1381]. "What is culture?", Tehran: Nashr Ney.
- [13] Ahmadnejad Sardrudi, F, [1390]. "Whisper of Azerbaijan: Designing museum of culture, art and music of Azerbaijan", Tabriz Islamic Art University, Tabriz.
- [14] Giddens, A, [1376]. "Sociology", Saburi, M, Tehran: Nashr Ney.
- [15] Grouter, Y, [1386]. "Aesthetic in architecture", Pakzad, J, Homayoun, A, Tehran: ShahidBeheshti University.
- [16] Vesali S, Tavakol M, [1391] Investigating impact of social capital on living quality in Tehran", Urban studies magazine, issue 2, spring 1391: 197-220.
- [17] UNO [2002] Earth Summit, Unite Nations' Johannesburg Declaration.
- [18] Matthews, John & Herbert, David, [Eds.] [2004] Unifying Geography: Common Heritage, Shared Future? Oxfordshire, UK: Routledge.
- [19] Beatley, Timothy & Manning, Kristy [1997] The Ecology of Place: Planning for Environment,Economy.
- [20] ZohuriKhosroshahi, H, [1385]. "Vertical development scheme of traditional bazaar of Tabriz [Saheb-al-Amr sq. Tabriz]", Islamic Azad University of Tabriz, Tabriz.
- [21] Soltanadeh H, [1380]. "Iranian bazaars", Center of cultural research, Tehran.
- [22] Momeni M, [1373] Excellent place of bazaar of Tabriz among traditional bazaars of Islamic world", 9th Congress of Geographers of Iran, Tabriz, 9-21 Mehr.
- [23] Habibi M, [1378]. "From city to city", Tehran: Tehran University press.
- [24] Soltanzadeh H, [1376]. "Tabriz, a solid adobe in Iran's architecture", Center of cultural research, Tehran.
- [25] Kiani M, [1368]. "Architecture of Iran: Islamic era", Tehran: JahadDaneshgahi press.
- [26] Organization of cultural heritage and tourism and handicrafts, [1390], House of bazaar of Tabriz.
- [27] Mojtahedzadeh G, [1368], "An introduction to principles and basics of regional planning", Tehran: Ministry of Education press.
- [28] Qorbani K, [1382]. "Renewal and organization of commercial traditional urban fabric [bazaar of Tabriz], Tehran: TarbiatModares University.
- [29] Roseland M. [2005] Towards Sustainable Communities: Resources for Citizens and their Governments, Island: New Society Publishers.

ARTICLE

EFFECT OF LOW LEVEL (INFRA RED) LASER THERAPY ON THE SURGICAL WOUND HEALING IN HAMSTER

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ABSTRACT

Back ground and objective: Accelerating wound healing is a very important factor for patients to return to ordinary life. Due to previous studies, Laser seems to have positive modality effect on cutaneous wound healing. This study aims to investigate the effect of infrared light laser on cutaneous surgical wound in hamster and to compare factors such as angiogenesis, number of fibroblasts and collagen formation with control group. **Materials and methods:** This was an experimental study which was carried out with correlation of Quazvin University of medical science with MEHREGAN pet clinic in winter of 2009. Twenty -five suri hamster were randomly allocated in two groups and four parallel wounds was made on their back, Case group was radiated by red-light laser 630 nm. After 2/5/10 and 14 days, skin biopsy were obtained and number of vessels, fibroblast and collagen production were compared with control group. **Result:** Evaluation of wound in experimental and control groups showed significantly increased number of vessels and fibroblast as well as collagen production in laser radiating group. **Conclusion:** Our study suggest that laser therapy can accelerate wound healing in comparison with control group.

INTRODUCTION

Acceleration of cutaneous wound healing is a very important factor after surgery for surgeons for returning to ordinary life style in earlier time. Wound healing is complex phenomenon involving a number of processing including induction of acute inflammatory process, migration and proliferation of parenchyma and also connective tissue cells, synthesis of ECM proteins, remodeling of connective tissue and parenchymal component and then collagenization and acquisition of wound strength. [1,2,3] After day 3, granulation tissue progressively invade the incision space and collagen fibers start to present. By day 5, neovascularization is maximal and fibroblasts proliferate. During the second week, accumulation of collagen and proliferation of fibroblasts is continued. [4]

Low level laser therapy is a form of phototherapy that involves the application of low power monochromatic and coherent light to lesions to stimulate wound healing. It can increase the speed, quality and tensile strength of tissue repair [5]. The effect of LLLT are photochemical, not thermal and the response of cells due to changes in photo acceptor molecules (known as chromophores) [6].

The exact mechanism of action of LLLT has not been completely understood but it can stimulate metabolism [7]. The effect of LLLT including wound epithelialization, reduction of edema and inflammation, increase granulation tissue, increase fibroblastic proliferation, increase extracellular matrix synthesis and neovascularization, all of which lead to better tissue oxygenation and nutrition and enhance wound healing [8,9,10] Previous studies revealed that the amount of total collagen was significantly increased in laser treated wounds over control group also it accelerates the production of collagen. [11]

In this study we evaluate the effect of infra red-light laser nm in wound healing in hamster and compare with control group.

MATERIALS AND METHODS

This was an experimental study which was carried out in small animal clinic of Mehregan and Qazvin University. All animal procedures were in accordance with the declaration of Helsinki and the guide for the care and use of laboratory animals.

We performed our study on a Total 25 suri hamster (random male and female). They were randomly divided into two groups including 15 experimental and 10 control groups. After anesthesia we performed four parallel surgical scrap on the back of hamster measuring each one 1cm in both groups. Red light laser nm was radiated 6 times, each time 10 seconds to 15 hamster of experimental group. Then biopsy were taken in day second, days fifth, tenth and fourteenth after radiation from both experimental and control groups.

Sample were sent in formalin 10% to laboratory. Tissue processing and sectioning of paraffin embedded tissue were done and then slides stained with H&E (hematoxylin and Eosin).

KEY WORDS

Laser, Wound healing, Angiogenesis, Fibroblasts, Collagen formation.

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Sides were studied by pathologist. Number of vesseles in field 40 was counted in day second and day fifth samples in both groups.

Also median number of fibroblasts in field 100 was counted in day fifth and day tenth samples in both groups. For day fourteen specimen samples, Trichrom staining were performed and qualitative estimation for collagen formation in two groups were done. Data were analyzed through independent student T. test using SPSS version 10 and statistical P value less than ./.5% was considered significant and in non normal distribution. Kolmogorov-Smirnov test performed for data such as number of fibroblasts in day fifth and tenth.

RESULTS

Histologic evaluation of wounds in two groups and the statistical analysis of data revealed significant difference between control and laser treated hamsters in mean number of vesseles and number of fibroblasts [Table 1].

Table1: number of vesseles in control and laser treated group in day second samples

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Control	18	18	20	18	19	20	19	21	18	22	19	17	20	13	25
Laser radiated	23	23	27	23	26	26	25	28	24	29	23	22	27	22	30

Table 2: Mean and SD of vessele number in two groups in day second samples

SD	Mean of vesseles number	Group
2/03	19/47	Control
2/6	25/2	Laser treated

(P=/.001%) in independent sample T test

Second day samples show mean number of 19/4 of vesseles in control group in comparison to laser treated group with mean number of vesseles of 25/2. T test show significant difference between two groups (P<%015) [Table 2].

Table 3: Number of vesseles in day fifth

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Control	35	32	30	35	31	29	33	31	30	34	32	30	29	35	34
Laser radiated	40	36	30	40	34	30	38	35	32	40	40	35	30	40	40

Table 4: Mean and SD of vesseles number in two groups in day fifth

SD	Mean of vesseles number	Group
2/2	32	Control
4/05	36	Laser treated

In fifth day samples also mean number of vesseles in 15 hamster was 36 in red light radiated group which show significant difference in comparison to control group. [Table 3,4] and [Fig. 1]



Fig. 1: It shows laser radiation of wound in hamster.

Table 5: Number of fibroblasts in day fifth

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Control	60	65	60	60	61	63	61	59	62	60	64	61	60	61	62
Laser radiator	62	74	62	65	67	70	68	60	70	60	71	70	65	65	70

Table 6: Mean and SD of fibroblasts number in day fifth

SD	Mean of fibroblast number	Group
1/67	61/27	Control
4/31	66/6	Laser treated
4/31	66/6	Laser treated

$P < 0.001$ in Mann-Whitney test

Number of fibroblasts estimated in experimental and control group (61/2 and 66/6) which show significant difference in Kolmogorov-Smirnov test between two groups ($P < 0.0001$) [Table 6] and [Fig. 2]

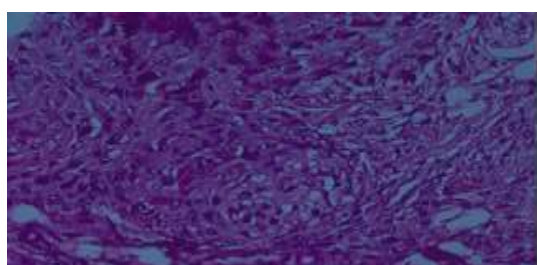
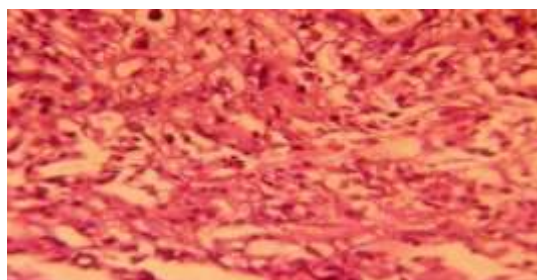


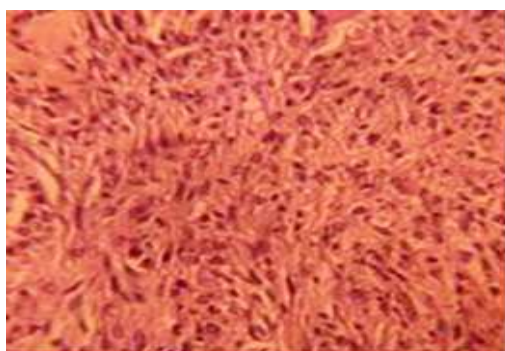
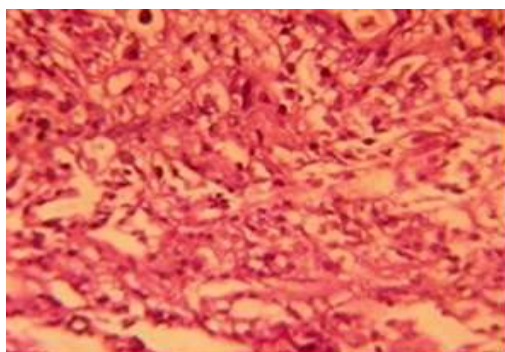
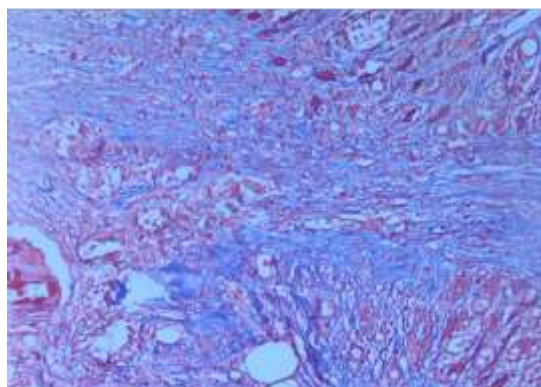
Fig. 2: Comparison of vessels number in fifth day in control and laser treated group.

Table 7: Mean number of fibroblasts in day tenth samples

SD	Mean of fibroblasts number	Group
1/64	53/37	Control
2/12	71/73	Laser treated

$P < 0.001$ in Mann-Whitney test

In day tenth samples, mean number of fibroblasts in two groups show also significant difference with the same test ($P < 0.001$) [Table 7], [Table 8] Qualitative collagen production with trichrom staining in fourteen day samples show significantly increased collagen production in experimental groups in comparison to case group [Fig. 3], [Fig. 4]

**Fig. 3:** Comparison of fibroblasts number in day fifth in control and laser treated group.**Fig. 4 :** Increased collagen production in day fifteenth specimens in laser treated group (Trichrom staining).

DISCUSSION AND CONCLUSION

Studies has showed that laser therapy in wounds can increase cellular content and enhance granulation tissue formation, collagen deposition and fibroblasts production. [12,13]. it is unclear how LLLT works. LLLT may reduce pain related to inflammation by lowering, in a dose-dependent manner, levels of prostaglandin E2, prostaglandin-endoperoxide synthase 2, interleukin 1-beta, tumor necrosis factor-alpha, the cellular influx of neutrophil granulocytes, oxidative stress, edema, and bleeding. The appropriate dose appears to be between 0.3 and 19 joules per square centimetre. [14] Another mechanism may be related to stimulation of mitochondrion to increase the production of adenosine triphosphate resulting in an increase in reactive oxygen species, which influences redox signalling, affecting intracellular homeostasis or the proliferation of cells [15] The final enzyme in the production of ATP by the mitochondria, cytochrome c oxidase, does appear to accept energy from laser-level lights, making it a possible candidate for mediating the properties of laser therapy. Helium Neon (632/8 nm) and laser diodes between (633-670 nm) are absorbed by the mitochondria cytochroms (mainly cytochrom C oxidase) and known to act mainly on superficial epithelial tissue due to limited penetration of red light. [16] studies have shown that endothelial cells showed higher cell counts when irradiated with (660 nm) wave length (in comparison with 820nm). It induce fibroblasts to secrete growth factors and cytokines, possibly increasing rate of mitosis and reducing cell death. then they are effective in wound healing. Laser therapy is a simple and non invasive therapy which can promote wound healing, relief pain and have no reported side effects [17] Accelerating of surgical wound healing help patients recover to normal life. in this study we evaluated the effect of low-level laser therapy (630nm) in accelerating wound healing in hamster. Our study showed that laser therapy can significantly increase number of vessels in second and fifth days. Laser can stimulate proliferation of fibroblasts and increase its number (in day 5 and 10). It is significantly effective in collagen production and can promote process of collagenization (in day 14). Then our study suggest low level laser therapy can accelerate wound healing in rats.

Our study suggest that low level laser therapy (630nm) can accelerate and promote surgical wound healing in hamsters.

CONFLICT OF INTEREST

There is no conflict of interest.

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None

FINANCIAL DISCLOSURE

None

REFERENCES

- [1] Chaudhary SR, Mistry J, Patel PB Siddiquee GM, Patel JS. [2011] Surgical management of buccal fistula in a camel (*Camelus dromedarius*). *Journal of Camel Practice and Research*, 18(2):345-346.
- [2] Treacle AM, Thom KA, Furuno JP, Strauss SM, Harris AD, Perencevich EN. [2009] Bacterial contamination of the health care workers' white coats. *Am J Infect Control*. 37(2):101-105.
- [3] Treacle AM, Thom KA, Furuno JP, Strauss SM, Harris AD, Perencevich EN. [2009] Bacterial contamination of the health care workers' white coats. *Am J Infect Control*. 37(2):101-105.
- [4] Grabsch EA, Burrell LJ, O'Keeffe JM, Ballard S, Grayson L. [2006] Risk of environmental and healthcare worker contamination with vancomycin resistant enterococci during outpatient procedures and haemodialysis. *Infect Control Hosp Epidemiol*. 27:287-293. Treacle AM, Thom KA, Furuno JP, Strauss SM, Harris AD, Perencevich EN. [2009] Bacterial contamination of the health care workers' white coats. *Am J Infect Control*. 37(2):101-105.
- [5] Grabsch EA, Burrell LJ, O'Keeffe JM, Ballard S, Grayson L. [2006] Risk of environmental and healthcare worker contamination with vancomycin resistant enterococci during outpatient procedures and haemodialysis. *Infect Control Hosp Epidemiol*. 27:287-293.
- [6] Purohit S, Chaudhary SR, Mistry J, Patel PB Siddiquee GM, Patel JS. [2011] Surgical management of buccal fistula in a camel (*Camelus dromedarius*). *Journal of Camel Practice and Research*, 18(2):345-346.
- [7] Treacle AM, Thom KA, Furuno JP, Strauss SM, Harris AD, Perencevich EN. [2009] Bacterial contamination of the health care workers' white coats. *Am J Infect Control*. 37(2):101-105.
- [8] Purohit S, Chaudhary SR, Mistry J, Patel PB Siddiquee GM, Patel JS. [2011] Surgical management of buccal fistula in a camel (*Camelus dromedarius*). *Journal of Camel Practice and Research*, 18(2):345-346.
- [9] Treacle AM, Thom KA, Furuno JP, Strauss SM, Harris AD, Perencevich EN. [2009] Bacterial contamination of the health care workers' white coats. *Am J Infect Control*. 37(2):101-105.
- [10] Treacle AM, Thom KA, Furuno JP, Strauss SM, Harris AD, Perencevich EN. [2009] Bacterial contamination of the health care workers' white coats. *Am J Infect Control*. 37(2):101-105.
- [11] Grabsch EA, Burrell LJ, O'Keeffe JM, Ballard S, Grayson L. [2006] Risk of environmental and healthcare worker contamination with vancomycin resistant enterococci during outpatient procedures and haemodialysis. *Infect Control Hosp Epidemiol*. 27:287-293. Treacle AM, Thom KA, Furuno JP, Strauss SM, Harris AD, Perencevich EN. [2009] Bacterial contamination of the health care workers' white coats. *Am J Infect Control*. 37(2):101-105.
- [12] Grabsch EA, Burrell LJ, O'Keeffe JM, Ballard S, Grayson L. [2006] Risk of environmental and healthcare worker

- contamination with vancomycin resistant enterococci during outpatient procedures and haemodialysis. *Infect Control HospEpidemiol.* 27:287-293.
- [13] Purohit S, Chaudhary SR, Mistry J, Patel PB Siddiquee GM, Patel JS. [2011] Surgical management of buccal fistula in a camel (*Camelus dromedarius*). *Journal of Camel Practice and Research*, 18(2):345-346.
- [14] Treagle AM, Thom KA, Furuno JP, Strauss SM, Harris AD, Perencevich EN. [2009] Bacterial contamination of the health care workers' white coats. *Am J Infect Control.* 37(2):101-105.

ARTICLE

ASSESSMENT THE EFFECT OF DEHKHODA SUGARCANE AGRO-INDUSTRY ON ECONOMIC CHANGES OF DAGHAGHELEH VILLAGE

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ABSTRACT

Dehkhoda agro-industrial complex is the seventh companies in a series of affiliated agro-industries of Sugarcane Development Company and Subsidiaries. In this study, Dagbagheleh village the suburb of Ahvaz city has been analyzed which is located near to this agro-industry. The objectives of this study include: understanding the effects of Dehkhoda agro-industrial complex activities on employment trend, emigration and changes of major crops sample in village area. This research has been done by descriptive- analyzing method and by using field observations and questionnaire completion. The statistical population of it includes residents of the village about 100 households. Final evaluation of data and variables was done by using factor analysis and one-sample t-test. The obtained results stated that Dehkhoda agro-industrial complex has not only have positive and effective impact on improving employment conditions and reducing unemployment, reducing migration, fundamental changes in major crops sample and totally economic developments, but also its negative results was observed in studied village.

INTRODUCTION

The life of each village is depended on dynamism and its economic durability. So that one of the most important causes of depletion and abandoned of many of country's villages stem from weaknesses and inefficiency of their economies. Iran country due to its unique geographical location is considered one of the few countries with a good diversity of climate and atmosphere, therefore; it causes to create diverse economic productivity in its villages, so that in some rural areas of Iran economic activities are seen in different kinds.

Immigration debates and increasing emigration of peasants to cities and problems related to this issue are current issues and problems of villages of country. The main reason of rural emigration to cities has been to earn money and finding job, therefore; in this regard the activity of Dehkhoda agro-industrial Company in creating jobs in its operational range is of great importance.

Agro-industry is a combination of agricultural activities and its affiliates industry, that plains are such places has a high capacities and potentials for such activities. In this regard Khuzestan's plain is one of the largest plains with smooth and flat limited area in Iran with highest natural potentials such as water, air and soil.

Dehkhoda agro-industrial complex is the seventh companies in a series of affiliated agro-industries of Sugarcane Development Company and Subsidiaries; it was established to achieve country's economic and social major targets, in order to provide a part of required sugar of country and other applied products in chain of productions of downstream industries of sugarcane, and creating sustainable employment, by cooperation of ministry of agriculture with Saderat and Melli banks.

Given to the strategic importance of sugar product, sugar council was established in 1983 and execution the plan of sugarcane development and subsidiaries in Khuzestan was ratified by Islamic Consultative Assembly, and ministry of agriculture was obliged by it to establish 7 units of sugarcane agro-industries in a land area in extent of 84 thousand hectares, in order to become self-sufficient in sugar supply needs of the country and part of the other nutritive and industrial needs of society [1].

Karoon agro-industry complex has caused to provide employment in nearby villages, job diversity, increasing job opportunities, reducing permanent immigration from village to urban areas, increasing daily migration from neighborhood's urban areas to the region and changing cropping pattern in under studied rural district [2].

Reached to this result in his analyses that construction of Nazarabad industrial town, has had a positive role in various economic and social aspects of villages of Najmabad rural district [3].

It has been reported in other research that Miami industrial district of Shahrood city by creating job opportunities for peasants and increasing their income, caused peasants to emigrate to the city [4].

Reached to the result that economic performance of villages of Sowme'eh Sara province has been influenced by surrounding cities and these influences has been different from past to present and

KEY WORDS

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effectiveness of rural economic performances from province has not been hierarchically. The villages of the province are in relation with other cities in addition to cities of this province as well [5].

According the report of the Housing Foundation of Islamic Revolution [6], rural guidance plan in upper Abgarmack, by creating capabilities in the field of agriculture, industry and services has caused to provide opportunities for employment and consequently high population density in comparison with other parts of the province.

Industrial districts have not been successful in creating job opportunities for peasants of Markazi province, because most of their employees were urban residents [7].

Establishment of industries in villages causes to reduce migration and to preserve the population of the region [8].

considers industrialization as a motive motor of rural development in China and he believes that by establishing industry in rural regions, in addition to increase families' income, the food consumption patterns and durable consumption goods have been changed significantly [9].

Non-agricultural activities have had a considerable share in homogenization and stability of peasants' income during the year. Liedholm's analysis shows that fluctuation of monthly income of rural families in Thailand with industrial activities has been much less than variability of total income of rural families with agricultural activities [10].

MATERIALS AND METHODS

The present study is descriptive - survey method that it was done by using questionnaire in Daghighaleh rural community in order to investigate the effect of Dehkhoda sugarcane agro-industry on its economic changes. Items were determined scientifically from the perspective of researchers and then items in form of 22 questions questionnaire were analyzed in 3 indexes include 5 items of social indexes, 12 items of economic indexes and 5 items of shifting cultivation indexes. As was said, the statistical population of families of Daghighaleh village was 100 households. Validity of questionnaire was confirmed by view of a number of specialists and its reliability was confirmed with the implementation of the questionnaire over 20 families of statistical population and calculation of equamax rotation ($kmo=0/715$). After completing the questionnaire the descriptive methods were used such as frequency, average, standard deviation as well as statistical t tests of independent groups for comparison the views of respondent groups to the questionnaire in terms of sex, age and education. Normalization of data was done by valid test of Kolmogorov-Smirnov and their analysis by SPSS software. Criterion of judgment and conclusion was the average of obtained scores.

RESULTS AND DISCUSSION

All 100 distributed questionnaires were collected. According to obtained results of questionnaire, 18 percent of respondents were single and 82 percent were married; the family's numbers of 39 percent of respondents were 0-3 persons, family's numbers of 52 percent of respondents were 4-7 persons and family's numbers of 9 percent of respondents were 8-11 persons, 58 percent of respondents were under diploma, 33 percent diploma, 3 percent associated degree, 6 percent of them bachelor degree and higher; 10 percent of respondents were 17-23 years old, 28 percent were 24-30 years old, 29 percent were 31-37 years old, 25 percent were 38-44 years old and 8 percent were 45-51 years old; 23 percent of respondents were unemployed, 2 percent were employee, 8 percent were workers and 67 percent had other jobs

Investigating the effects of social indexes in under studied village

In order to examine the effects of social indexes in under studied village the following items were used: "to what extent has Dehkhoda agro-industry been effective on immigration of your village, to what extent has development of Dehkhoda agro-industry complex been for the aim of job creation in the region, to what extent has Dehkhoda agro-industry been effective in reducing migration of village's residents to the city, how many families have moved to your current residence from neighboring villages during the last ten years, how often in the week do you go to Ahvaz to provide the needs of your life [Table 1].

Given to [Table 1] the average of total impact of social indexes is equal to 2/38 that was not in appropriate condition in terms of rating.

Among the items of research in part of social indexes, the lowest average is belong to "to what extent has Dehkhoda agro-industry been effective on immigration of your village" with an average of 2/03 and standard deviation of 0/834 and the highest of it belongs to the index of "how often in the week do you go to Ahvaz to provide the needs of your life" with an average of 2/71 and standard deviation of 1/04.

Table 1: The effects of social indexes in Daghighaleh village

item	The amount of effectiveness	average
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		Very weak	weak	medium	good	Very good		
1	to what extent has Dehkhoda agro-industry been effective on immigration of your village	26	52	015	4	0	0/834	2/03
2	To what extent has development of Dehkhoda agro-industry complex been for the aim of job creation in the region	23	40	033	4	0	0/833	2/18
3	To what extent has Dehkhoda agro-industry been effective in reducing migration of village's residents to the city?	19/0	42	027	11	10	0/943	2/33
4	how many families have moved to your current residence from neighboring villages during the last ten years	11/0	28	048	10	30	0/912	2/66
5	How often in the week do you go to Ahvaz to provide the needs of your life?	8/0	43	025	18	60	1/04	2/71
total		17/4	41	629	10	20	0/ 503	2/38

Investigating the effects of economic indexes in under studied village

In order to investigate the effects of economic indexes in under studied village the following items have been used: "to what extent do you prefer to provide your own needs in your residence village, given to the current situation have you ever thought to have permanent immigration, how many of your close friends, relatives and your family are employed in Dehkhoda agro-industry, how many people of your immediate family are engaged in agricultural work on their private land, how much has Dehkhoda agro-industry complex been effective to expand ancillary services in your village, to what extent has establishment of Dehkhoda agro-industry been effective in reducing unemployment in your village, to what extent has establishment of Dehkhoda agro-industry had role in workers' skill, to what extent has employment in Dehkhoda agro-industry been effective in changing your family income (it has caused to increase income), to what extent do the women of families contribute to their family's livelihoods, to what extent do you like your children will work in the future in the Dehkhoda agro-industry complex, how much of the land around your village is occupied by Dehkhoda agro-industry, how much of your agricultural products is sent to outside of the village to sale in foreign markets" that they have been evaluated by items of [Table 2]. Given to [Table 2] the average of total impact of economic indexes is equal to 2/45 that was not in appropriate condition in terms of rating.

Among the items of research in part of economic indexes, the lowest average is belong to index of "how many of your close friends, relatives and your family are employed in Dehkhoda agro-industry" with an average of 2/03 and standard deviation of 0/869 and the highest of it belongs to the index of "to what extent do you like your children will work in the future in the Dehkhoda agro-industry complex" with an average of 2/98 and standard deviation of 1/16.

Table 2: The effects of economic indexes in Daghaheleh village

order	questions	The amount of effectiveness					Standard deviation	average
						good		
6	To what extent do you prefer to provide your own needs in your residence village?	6/0	26	42	23	3	0/922	2/91
7	Given to the current situation have you ever thought to have permanent immigration?	6/0	38	38	15	3/0	0/902	2/71

8	How many of your close friends, relatives and your family are employed in Dehkhoda agro-industry?	33/0	34	30	3	0	0/869	2/03
9	How many people of your immediate family are engaged in agricultural work on their private land?	11/0	43	37	9	0	0/808	2/44
10	How much has Dehkhoda agro- industry complex been effective to expand ancillary services in your village?	31/0	31	35	3	0	0/881	2/10
11	To what extent has establishment of Dehkhoda agro-industry been effective in reducing unemployment in your village?	35/0	42	15	8	0	0/909	1/96
12	To what extent has establishment of Dehkhoda agro-industry had role in workers' skill?	17/0	42	38	3/0	0	0/726	2/27
13	To what extent has the employment in Dehkhoda agro-industry been effective in changing your family income (it has caused to increase income)?	23/0	41	32	4/0	0	0/829	2/17
14	To what extent do the women of families contribute to their family's livelihoods?	8/0	32	490	8/0	3	0/855	2/66
15	To what extent do you like your children will work in the future in the Dehkhoda agro-industry complex?	9/0	26	38	12/0	15	1/16	2/98
16	How much of the land around your village is occupied by Dehkhoda agro-industry?	15/0	35	37	10/0	3	0/969	2/51
17	How much of your agricultural products are sent to outside of the village to sale in foreign markets?	4/0	37	47	11/0	1	0/763	2/68
	Total	16/5	35/6	36/5	9/08	2/3	0/404	2/45

Investigating the effects of shifting cultivation indexes in under studied village

In order to investigate the effects of shifting cultivation indexes in under studied village the following items have been used: "to what extent has the kind of your cultivation been changed in the past ten years, to what extent has establishment of Dehkhoda agro-industry complex been effective in changing type of your cultivation, to what extent has the amount of your cultivation been added after construction of Dehkhoda agro-industry, to what extent do your family is provided from agricultural activities, to what extent has Dehkhoda agro-industry complex been effective in establishment of communication paths" that they have been evaluated by items of table 3. Given to the table 3 the average of total effect of shifting cultivation indexes is equal to 2/46 that is not in appropriate condition in terms of rating.

Among the items of research in part of shifting cultivation indexes, the lowest average is belong to "to what extent has amount of your cultivation been added after construction of Dehkhoda agro-industry" with an average of 2/28 and standard deviation of 0/865 and the highest of it belongs to the index of "to what extent do your family is provided by agricultural activities" with an average of 2/74 and standard deviation of 0/760.

Table 3: The amount of effectiveness of shifting cultivation indexes in Daghighaleh village

order	questions	The amount of effectiveness					Stand ard deviati on	average
						good		

18	to what extent has the kind of your cultivation been changed in the past ten years	6/0	33/0	047	13	1	0/810	2/70
19	To what extent has establishment of Dehkhoda agro-industry complex been effective in changing type of your cultivation?	21/0	39/0	034	2	4	0/956	2/29
20	To what extent has the amount of your cultivation been added after construction of Dehkhoda agro-industry?	18/0	44/0	031	6	1	0/865	2/28
21	To what extent do your family is provided by agricultural activities?	6/0	26/0	057	10	1	0/760	2/74
22	To what extent has Dehkhoda agro-industry complex been effective in establishment of communication paths?	18/0	40/0	037	5	0	0/820	2/29
Total		13/8	36/4	241	7/2	1/4	0/563	2/46

CONCLUSION

- 1- Dehkhoda agro-industry complex has not had any determinative and effective role on economic developments of Daghighaleh village.
- 2- Dehkhoda agro-industry complex has not had any determinative and effective role on social developments of Daghighaleh village.
- 3- Dehkhoda agro-industry complex has not had any effective role in reducing emigration in under studied region.
- 4- Establishment of Dehkhoda agro-industry complex has not been effective on employment and reducing unemployment rate in under studied region.
- 5- Activity of Dehkhoda agro-industry complex has not had any effective role in under studied region on creation major changes in cropping pattern (dominant cropping).

CONFLICT OF INTEREST

Authors declare no conflict of interest.

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REFERENCES

- [1] Barat Shooshtari M. [2008] Sugarcane in Iran, Aeezh publication.
- [2] Fatemi Amareh M. [2011] Analyzing the effect of sugarcane agro-industry on economic changes of neighboring villages, case study: Sardarabad rural district, Azad University Tehran Branch, Master's Thesis.
- [3] Akbari MR. [2010] The effect of establishment of industrial town on economic and social changes of villages of Najmabad rural district, MA, geography group, Dr. Zahra Arazjany, Faculty of literature and humanities, Islamic Azad University Central Tehran Branch.
- [4] Darafarin F. [2009] the effectiveness of villages from industrial region, case study Miami industrial district of Shahrood province, MA, geography group, Dr. Shohreh Taj, Faculty of literature and humanities, Islamic Azad University Central Tehran Branch.
- [5] Gottidiener M, Leslie B. [2005] Key concepts in urban studies. London, Sage Publications.
- [6] Hosseini SA. [2007] Housing Foundation of Islamic Revolution, consultant engineers of landscape and design, plan preparation.
- [7] Taherkhani M. [2000] the role of industrial districts in development of rural areas, case study: Markazi province, Tarbiat Modares University: PhD thesis.
- [8] Shibani HR. [1998] the role of establishment of small industries in economic development and spatial order of rural areas, case study: town of Javad Abad Varamin Shahid Beheshti University, Master's Thesis.

- [9] Rizwanul I. [1994] Rural Industrialization: An Engine of Prosperity in Postform Rural China, World Development. 22(11):1643-1662.
- [10] Liedholm C. [1989] The Role of Non – Farm Activities in the Rural Economy, the Balance Between Industry and Agriculture in Economic Development, Macmillan Press. 427.

ARTICLE

RURAL MIGRATION OUTCOMES ON THE SUSTAINABLE DEVELOPMENT INDICATORS (CASE STUDY: GOLDASHT QUARTER IN AHVAZ)

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ABSTRACT

Informal settlements over the past few decades together with the rapid growth of cities in most developing countries have gained an unprecedented expansion. Urban migration of rural people has brought about such problems as disproportionate accommodation in the suburb areas confronting the sustainable development of rural settlements with difficulties. The main objectives of this study included: investigating the outcomes of rural migration as the cause of development and expansion of marginalization taking into consideration the social, economic, and environmental dimensions as well as for the elimination of existing disparities and sustainable development planning for the Goldasht quarter. A sample size of 361 households was estimated based on the Cochran's formula and adjusted according to the Likert spectrum. SPSS software was used to analyze the data obtained. After examining the validity of the questionnaire in this study, the KMO value was obtained as 0.766 suggesting the adequacy of sampling. The results of study hypotheses following factor analysis suggest that rural migration has no effects on the improvement of economic indicators in the suburb and that rural migrations have had negative effects on environmental issues in the outskirts. Furthermore, rural migrations have a lack of services and amenities in the outskirts.

INTRODUCTION

Informal settlements over the past few decades together with the rapid growth of cities in most developing countries have gained an unprecedented expansion. Urban migration of rural people has brought about problems such as disproportionate accommodation in the suburban areas confronting the sustainable development of rural settlements with difficulties. After the Industrial Revolution, marginalization has expanded with the development of cities so that it has disturbed the physical balance of cities. For that reason, it has incorporated both the rural migrants and the urban poor. In Iran, marginalization was initially driven around the cities and rural migrants from villages and small towns settled around cities due to a high cost of urban land.

Slums, shanty, slum dwellers and, in a more general concept, marginalized people, are the forgotten parts of cities in which housing and living conditions are very low and unsuitable [1].

Marginalization includes the lives of all those living in urban areas, but are living in undesirable conditions in terms of income and the use of facilities and utilities. They are known as examples of the disparate, whom are not requested any comments on the future issues of cities and settlements being completely indifferent [2].

The concept of urban sustainable development implies the urban socioeconomic development whilst persisting the protection of land resources for present and future generations in order to re-exploit the natural resources within the capacity of natural systems and coordination of development projects [3].

In our country, rural-urban migrations have expanded due to the implementation of inappropriate development patterns and sidelining agriculture so that it is considered as a social, political, and economic problem. Some of these problems include irregular population growth and an increase in the population of cities as well as depopulation of villages. In addition, poverty and unemployment are among the problems that threaten villagers, hence, they migrate to cities to improve their lives with no planning.

Ahvaz is one of the cities involved in the issue of marginalization; in these areas, there have been problems such as marginal employment in informal and false jobs, unauthorized constructions, inability of municipalities to provide adequate services in these areas, environmental pollution, adverse cultural, economic, social, and political consequences, and increased crime and deviances in these regions.

Goldasht quarter is one the marginalized neighborhoods in Ahvaz located within the jurisdiction of District 6 Municipality with an area of 175.51 hectares; its population amounted 2195 individuals according to the census statistics in 2006, and it has been reported to populate 6117 individuals in 2011. Based on a stock plan known as the Alley of Gardens dating back the period before the revolution, a number of stocks were offered in separate areas of 1000 meters with dimensions of 40 × 25; these were supposed to be converted into urban villas but the area was turned into a marginalized texture in Ahvaz following the

KEY WORDS

Migration, sustainable development, marginalization, Goldasht quarter.

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victory of the revolution in 1978 and the subsequent occurrence of the imposed war since 1980, which caused the influx of people residing in the border towns of Hovaizeh, Soosangerd, Hamidieh, etc. Additionally, the area had been seen as agricultural lands by the master plan in 1988 but it has become marginalized because of the present status. In this region, there are houses with less durable materials and at a low level of urban facilities and a poor state of health. The people of this region are also facing with a number of social, cultural, economic, and environmental problems.

The aim of this study was to evaluate the consequences of rural migration on the sustainable development indicators as a case study in the Goldasht quarter within the marginalized areas in Ahvaz during 1981-2015 and to provide solutions to the outcomes of migration on the socioeconomic, cultural, and environmental indicators. Moreover, the national and international studies conducted in this area will be discussed.

[4], studied the effects of rural migrations on the development of marginal settlements and threat to social security of urban areas within the Taher Kalan quarter in Ahvaz and found that one of the factors in the formation and spatial distribution of marginalized communities is a lack of space and poor distribution of public services rendering the centralization of poor groups in areas without adequate facilities and services as well as in cheap urban areas. In addition, due to economic problems, low income, and comparison with others living within the city, people have gained a great tendency to commit criminal conducts.

The causes of migrations to the city of Ahvaz among the inhabitants of marginalized neighborhoods within the Manba-e A'ab quarter in Ahvaz. Their results showed that the economic, cultural, and social factors, respectively, have had the greatest impacts on the immigrations of people [5].

the biggest problem of immigrants to be housing and job; they create informal settlements with regard to housing and in terms of job, they deal with false jobs or activities in the area of contraband, theft, and other criminal activities to comply with the environment. The authors suggest that creation of affordable housing, increasing technical and professional skills of villagers, and participating the residents in public management through the formation of councils and local communities to be appropriate strategies [6].

the main causes of marginalization in the Mallashiyeh of Ahvaz to be the lack of proper planning to build infrastructures and weakness of civil administration institutions in the cities of Khuzestan Province, especially the imposed war in Ahvaz as a very effective factor; the author has introduced the approach and strategy of organizing as one of the main solutions to the problem of marginalization [7].

Land ownership and other factors differently affect migrations. Accordingly, international migrations in the region are mostly affected by human capital and less influenced by agricultural practices and environmental conditions of the region. Local national and internal migrations are more affected by access to land and social capital [8].

Considers rural poverty as the main cause of migrations to the cities and believes that rural people move to cities to escape poverty injuries [9].

The relative role of people's satisfaction with their locations and mentions that immigration is a rational and targeted operation accomplished spontaneously by the immigrant to modify or improve the quality of life [10].

informal settlements to be the outcomes of antithetic and disfigure development in the urban system and stated that more than 50 percent of the world population live in cities, the spatial areas that draw a wide context of micro and macro communication structures, social conflicts, and organized violence. A lot of socio-economic and political problems in developing countries have been caused by disfigured growth and expansion of urban systems and spaces [11].

MATERIALS AND METHODS

This is an applied research and a descriptive-analytical one in terms of methodology. Data were collected through both library and field surveys. In the library method, the required information was obtained through books, organizational documents, articles, organizational archives, and various scientific websites. The second method consisted of field studies and interviews carried out via the preparation of questionnaires and, ultimately, classification and analysis of field studies.

The study population was a sample of 1233 households in the Goldasht district. Cochran's formula was used to determine the sample size. This formula is one of the most widely used methods to calculate the sample size, where (n) the sample, (N) population size, (z) the standard normal variable unit equal to 1.96 at a confidence level of 95%, (p) proportion of the population with a certain attribute, (q) the proportion of

the population lacking certain traits (if p and q values are not available, they can be considered 0.5), (d) the allowable error usually equal to 0.01 or 0.05.

Accordingly, a sample size of 361 households was obtained using the Cochran's sampling formula. The questionnaires were distributed among the study population and collected by researchers upon completion.

In order to achieve the desired validity, the questionnaire was modified according to the comments of supervisor, faculty members, and also through consulting with informed experts on the issues related to the research topic; eventually, the standardization and validity of the questionnaire were confirmed. Cronbach's alpha as a measurement tool was used to examine the reliability of the questionnaire. When the calculated percentage of this procedure is closer to 0.7, the questionnaire is more reliable. The Cronbach's alpha, therefore, was calculated for questions concerning the indicators of social, economic, and environmental services amounting to 0.85, 0.75, and 0.81, respectively, indicating the reliability of the questionnaire.

The variables in this study included migration, marginalization, sustainable development indicators, economic indicators, social indicators, and environmental indicators.

Data analysis and testing the hypotheses were performed by using the SPSS 20 statistical analysis software with two descriptive (frequency, mean, standard deviation) and inferential statistical methods such as Chi-square test, and correlation analyses of Pearson and Spearman.

RESULTS AND DISCUSSION

All 361 distributed questionnaires were collected. According to the results, there were 66.8 percent male and 33% female respondents. The age groups of the respondents consisted of 22.4 percent in 18-28 years, 29.4 percent in 29-38 years, 18.6 percent in 39-48 years, 20.2 percent in 49-58 years, and 9.4 percent in the group of 59 years and older. In terms of education levels, the percentages of respondents with under diploma, diploma, associate diploma, and bachelor's degrees, respectively, were 82%, 7.5%, 2.8%, and 7.8%. Regarding the headman's occupation of household among the respondents, there were 0.8% employees, 41.3% workers, 1.1% housewives, 5.5% hucksters, 26.9% self-employed, and 24.4% unemployed. The monthly income levels of the respondents amounted less than 200, 200,000 to 500,000, 500,000 to 1,000,000, and 1,000,000 to 20,000,000 Rial with frequencies of 31, 42.9, 24.4, and 1.7 percent, respectively; none of the participants earned 20,000,000 Rial and higher.

The results of the questionnaire revealed that all the respondents were not native to this area. Concerning the previous living situation of the respondents, 18.3, 73.4, 8.3, respectively, used to live in Ahvaz, the surrounding villages, and adjacent cities; none of the subjects used to live in nearby provinces. With respect to the main reason for the migration of the respondents, 38, 22.4, 29.9, and 9.7 percent, respectively, noted the war, better jobs and changing careers, more access to facilities, and further education of themselves and their children. About the main reason for choosing Goldasht quarter to live in, 34.1, 10.8, 15.2, and 39.9 percent of the respondents, respectively, denoted the cheapness of the land and housing as well as the low rents, proximity to the workplace, nearness to relatives, and security as the major causes. In terms of willingness to leave the current location, 20.7 percent of the respondents tend to leave the present location while 79.3 percent of them do not tend to abandon their current location. Regarding the tendency to leave the current location, 286 individuals out of all of the respondents (361 individuals) do not tend to leave their current location whereas 75 individuals incline to abandon their present place. From 75 people who tend to leave their current location, 5.3 percent due to health problems and environmental pollution, 1.1 percent because of low cultural level and 14.4 percent because of lacking amenities incline to depart their current location and none of the subjects mentioned their abandonment due to social ills. Concerning the status of unwillingness to leave the current location among 286 people who do not want to leave their current location, 37.9 percent reasoned the cheapness of land and housing as well as low rents, 37.4 percent due to proximity to relatives, and 3.8 percent because of nearness to the workplace do not want to abandon their existing location; none of the participants denoted very low expenses and appropriate income as the major motivations to stay in their present settlement.

With respect to the ownership status of housing units, 46, 21.3, and 32 percent of the respondents had owned property (with document), owned property (no document), and rented houses, respectively; none of the subjects had dedicated, free, and equal-to-service housing units. In terms of the situation of housing unit duration, 16.9, 23.8, 50.7, and 8.6 percent of the respondents, respectively, owned houses with durations of less than 5 years, 5-10 years, 10-20 years, and 20-30 years; none of the subjects owned houses more than 40 years old. In terms of materials used in the buildings of the respondents, 90% used in the brick and iron, 1.1% applied steel structure, and 8.8% employed concrete in the buildings; none of the subjects used adobe, clay, and wood materials in the structure. The qualities of the respondents' buildings included 16.1 percent with new structures, 19.7 percent as repaired, 3.3 percent as

destructible, and 60.9 percent as acceptable ones. The respondents' satisfaction states of settlement in the quarter showed frequencies of 0.8, 8.3, 82.3, and 8.6, respectively, for weak, moderate, good, and very good satisfaction levels; none of the subjects marked a very weak satisfaction level.

Descriptive findings

The effects of economic indicators in the Goldasht quarter

To evaluate the effects of economic indicators in the studied area, the following statements were questioned: "How is the economic situation of residents in Goldasht?, How is the welfare of your family?, How satisfied are you with your employment? How satisfied are you with your income?, How satisfied are you with the price of the residential land? How satisfied are you with access to jobs?, How satisfied are you with the quality of food?, How satisfied are you with the improvement of life standards ?, How much are you satisfied with family welfare?, How much is satisfaction with settlement in the quarter?, To what extent are you satisfied with the improvement of materials in your house (building)?" [Table 1].

According to [Table 1], the average total impact of economic indicators was not equal to 2.78, which is not in a good ranking.

Among the research statements in the field of economic indicators, the lowest average belonged to the index "How satisfied are you with access to the jobs?" with an average of 2.46 and a standard deviation of 0.933, and the highest average was recorded for the index "To what extent are you satisfied with the improvement of materials in your house (building)?" with an average of 3.62 and a standard deviation of 0.650.

Table 1: The impacts of economic indicators in the Goldasht quarter

Row	Item	Effectiveness					Standard deviation	Average
		Very weak	Weak	Moderate	Good	Very good		
1	How is the economic situation of residents in Goldasht?	0	33.2	64.3	2.5	0	0.513	2.69
2	How is the welfare of your family?	9.1	23.0	52.1	15.8	0	0.830	2.74
3	To what extent are you satisfied with your employment?	17.2	19.9	50.1	12.7	0	0.918	2.58
4	How satisfied are you with your income?	19.1	24.1	46.0	10.8	0	0.922	2.48
5	How satisfied are you with the residential land prices?	3.6	10.5	59.6	26.3	0	0.711	3.08
6	How satisfied are you with access to jobs?	21.1	21.6	47.4	10.0	0	0.933	2.46
7	How satisfied are you with the quality of food?	0.8	13.9	58.7	26.6	0	0.653	3.11
8	How satisfied are you with the improvement of living standards?	15.0	33.0	41.3	10.8	0	0.875	2.47
9	How satisfied are you with the welfare of the family?	13.6	31.3	41.0	14.1	0	0.896	2.55
10	To what extent are you satisfied with the improvement of materials in your house (building)?	2.2	2.8	24.9	70.1	0	0.650	3.62
Total		9.9	21.4	48.6	20.0	0	0.602	2.78

The effects of environmental indicators in the goldasht quarter

In order to investigate the effects of environmental indicators in the studied area, the following statements were questioned: "How is the state of cleanliness in the streets and locations?, How is the access to safe water in this area?, How is the status of sewage disposal in the area?, How is access to the sewerage network in this region? " [Table 2]. Among the items of research in the field of environmental indicators, the lowest average belonged to the index "How is access to the sewerage network in this region?" with an

average of 1.35 and a standard deviation of 0.478, and the highest average was recorded for the index "How is access to safe water in this area?" with an average of 2.78 and a standard deviation of 1.12.

Table 2: The effects of environmental indicators in the Goldasht quarter

Row	Items	Effectiveness					Standard deviation	Average
		Very weak	Weak	Average	Good	Very good		
11	What is the state of cleanliness in the streets and the quarter?	9.1	59.3	27.4	4.2	0	0.680	2.26
12	How is access to clean water in the area?	18.6	19.7	26.0	35.7	0	1.12	2.78
13	What is the status of sewage disposal in this area?	47.4	49.3	3.3	0	0	0.560	1.55
14	How is access to sewerage network in this area?	64.8	35.2	0	0	0	0.478	1.35
Total		35.0	40.9	14.1	10.0	0	0.490	1.99

The effects of service indicators in the Goldasht quarter

To evaluate the effects in the studied area, the following indicators were questioned: "How is the authorized access to electricity?, How is access to city gas?, How is the status of asphalt in this area?, How is the availability of healthcare home and health Service?, How is the access to primary school?, How is access to high school and pre-university? How is the status of public transportation (taxi)?, How is the status of public transportation (buses)?, How is the security situation in this area?, How are the security services and police centers?, How is access to shopping centers and malls in the area ?, How is the access to the phone?, How is the status of municipal services in the area?, To what extent are you satisfied with the improvement of the physical condition (physical) in this area?" [Table 3].

According to [Table 3], the average total impact of service indicators was equal to 2.78, which is not in a good ranking.

Among the items of research in the field of economic indicators, the lowest average belonged to the index "How is the status of public transportation (buses)?" with an average of 1.33 and a standard deviation of 0.496, and the highest average was recorded for the index "How is the security situation in this area?" with an average of 3.99 and a standard deviation of 0.139.

Table 3: The values of services indices in the Goldasht quarter

Row	Items	Effectiveness					Standard deviation	Average
		Very weak	Weak	Average	Good	Very good		
15	How is access to the authorized electricity?	0	32.7	8.0	59.3	0	0.922	3.26
16	How is access to city gas?	0	20.2	10.5	69.3	0	0.810	3.49
17	How is the status of asphalt in this area?	0	41.8	51.5	6.6	0	0.601	2.64
18	How is access to healthcare home and health services?	58.4	38.5	1.1	0.8	1.1	0.675	1.47
19	Access to primary school look like?	1.9	7.8	31.6	58.7	0	0.722	3.47
20	How is the status of access to high school and pre-university?	64.0	33.8	1.1	0	1.1	0.630	1.40
21	How is status of public transportation (taxi)?	0	0	3.0	95.8	1.1	0.203	3.98
22	How is the status of public transport (buses)?	67.3	31.6	1.1	0	0	0.496	1.33
23	How is the security situation in the region?	0	0	1.1	98.1	0.8	0.139	3.99
24	How are the security centers and police services?	0.8	22.7	49.0	27.4	0	0.731	3.03
25	How is access to shopping centers and malls in the area?	0.8	65.4	33.8	0	0	0.488	2.32

26	How is the access to the phone?	0	22.2	4.2	73.7	0	0.833	3.51
27	How is the status of municipal services in this area?	1.7	91.1	7.2	0	0	0.292	2.05
28	To what extent are you satisfied with the improvement of the physical condition in this area?	6.6	77.0	16.3	0	0	0.470	2.09
Total		14.4	34.6	15.7	35.0	0.3	0.211	2.72

Analytical results

Among the types of rotations in factor analysis, the Equamax rotation created the most suitable load factor on the indices. Therefore, this rotation was used to increase the load factor of more effective factors. Given that the value of KMO (almost 0.766) was more than 0.6 and also the significance level of Bartlett's test is $0.000 > 0.05$, therefore, the factor analysis is appropriate. The conducted analysis showed that the three factors explain about 68% of the variance or variability of the variables.

Table 4: The final statistical attributes based on the processing of three factors with eigenvalues greater than one

Main components	Percentage of variance explained by each factor	Percentage of total explained variance	Percentage of total explained variance
1	6.240	21.516	21.516
2	5.358	18.485	39.991
3	2.152	7.421	67.413

Testing hypotheses

The first hypothesis: It seems that rural migration has had a positive effect on improving economic indicators in the outskirts

According to [Table 5], the average responses to the indicators of economic components in the Goldasht quarter is equal to 2.78 showing that the focus of answers is very far from the number three indicating a vast difference between the sample average and the amount of the test value (3). In addition, based on contents of [Table 5], the significance level obtained is smaller than an error level of $\alpha = 0.05$. Also, the confidence intervals obtained for the difference between the average of the sample and the test value is negative, which is at least equal to -0.216, hence, the hypothesis is not acceptable; that is to say the migration of villagers did not have a positive effect on improving economic indicators in the outskirts. Moreover, because the average of responses is less than the mean value, the majority of participants have chosen the low and very low options. And due to the negativity of the minimal difference between the average of the sample and the test value, it is concluded that the rural migration has negatively affected the economic indicators in the outskirts.

Table 5: Comparison of average scores of the participants resulted from the one sample t-test

Number	Average	Standard deviation
361	2.78	0.602
t -statistic	df	Significance
-6.84	360	0.000
Difference between the average and the test value	Confidence interval of 0.95 for the difference between the average and the test value	
	Lower bound	Upper bound
-0.216	-0.279	-0.154

The second hypothesis: It seems that rural migrations have had negative effects on the environmental issues in the outskirts

One-sample t-test was used to assess the effects of rural migrations on the environmental issues in the outskirts. The results of this test indicate that there is a significant difference between the average of total environmental indicators (1.99) and number 3 at a confidence level of 95% ($p\text{-value} < 0.05$). However, the average obtained is lower than the theoretical mean (3) assessed and their difference from the numerical

suitability has also been assessed as negative, i.e. the majority of subjects have chosen the low and very low (negative effects) options. Therefore, the second hypothesis is accepted and it can be concluded that rural migrations have had negative effects on the environment issues in the outskirts [Table 6].

Table 6: Comparison of the mean scores of subjects in one-sample t-test

Number	Average	Standard deviation
361	1.99	0.490
t-statistic	df	Significance level
39.03	360	0.000
Difference between the average and the test value	Confidence interval of 0.95 for the difference between the average and the test value	
	Lower bound	Upper bound
-1.008	-1.05	-0.957

The third hypothesis: Rural migrations have the shortage of services and amenities in the outskirts

One-sample t-test was used to assess the effects of services and amenities in the outskirts. The results of this test indicate that there is a significant difference between the average of total service indicators (2.72) and number 3 at a confidence level of 95% (p value<0.05). However, the average obtained is lower than the theoretical mean (3) assessed and their difference from the numerical suitability has also been assessed as negative, i.e. the majority of subjects have chosen the low and very low (shortages) options. Therefore, the third hypothesis is accepted and it can be concluded that rural migrations have the shortage of services and amenities in the outskirts [Table 6].

Table 7: Comparison of mean scores of the subjects in one-sample t-test

Number	Average	Standard deviation
361	2.72	0.211
t-statistic	df	Significance level
-25.03	360	0.000
Difference between the average and the test value	Confidence interval (0.95) for the difference between the average and the test value	
	Lower bound	Upper bound
-0.278	-0.300	-0.256

CONCLUSION

Over the past few decades, informal settlements along with the rapid growth of cities have gained unprecedented expansions in many developing countries. Rural migration to urban areas has created problems such as disproportionate accommodation in the outskirts so that it has confronted sustainable development of rural settlements with difficulties. The physical conditions of marginalized locations include the lack of suitable amenities, environmental and health problems, and disability to provide adequate public services. The marginalized people are the urban poor preoccupied with the material issues. They lack many urban and economic amenities, have a low social status, are more satisfied with the rural life, and have limited progress motivation.

Due to the existing marginalization problems in Ahwaz as well as those in the Goldasht, this region was selected and the results showed that the main problem was illiteracy and consequently, there are many economic problems. They migrated from other rural areas mostly because of security problems and are satisfied with their current location, but are dissatisfied with the quality of municipal services.

The results showed that the root cause of the marginalization needs to be sought at the same factors that have led to rural-urban migration. When the villagers enter the city they inevitably settle the non-use suburban lands and in low-cost, marginalized areas as they possess no settlements and are also very poor financially. Additionally, because the marginalized lack adequate literacy and are often non-skilled and void of techniques and expertise, they are not absorbed in the urban economy, hence, the frequency of unemployment is exacerbated in these regions. Overall, sustainable urban development is affected by the presence of the marginalized and rural migrants and the results have shown that these effects have been true from both the social and environmental dimensions in the Goldasht area but not in the economic dimension.

CONFLICT OF INTEREST

Authors declare no conflict of interest.

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REFERENCES

- [1] Shaterian G, Ganji pour F, Oshnooie M, Mahmoud A. [2013] The informal settlements, an expanding phenomenon in the third millennium, Kashan, Kashan University.
- [2] Halfacree K. [2001] Constructing the Objects: Taxonomic Practices, Counter-Urbanization and Positioning Marginal Rural Settlement. Department of Geography, University of Wales Swansea, Singleton Park, Swansea, SA20 8A. UK.
- [3] Gottidiener M and Leslie B. [2005] Key concepts in urban studies. London, Sage Publications.
- [4] Bahrain N. [2015] The effects rural migrations on the development of marginal settlements and threats to social security urban areas (case study: Taher Alley neighborhood in Ahvaz metropolis), Master's thesis, Supervisor Dr. Zahra Khazaie, Islamic Azad University, Ahvaz branch.
- [5] Ahmadnia E, Ghanavati A, Amirshakeri R. [2014] Examining the causes of migration to the city of Ahvaz among the residents in marginal neighborhoods; Case study: Manba-e A'ab district, the Seventh Congress of Iranian Geopolitics (geopolitics of the city), the Association of Iranian Geopolitics, University of Al-Khwarizmi, Tehran.
- [6] Khazayi Z. [2012] Assessment of the socio-economic and physical characteristics of informal settlements; case study Sayyahi district of Ahvaz metropolis, Quarterly Journal of Land Geography, 9th year, Issue 33, thirteen spring.
- [7] Janadeleh A. [2012] Investigating the causes of marginalization in Ahvaz (case study: Mollashiyeh), Master's thesis, Islamic Azad University, Ahvaz branch.
- [8] Clark I and Gray S. [2009] Environment ; Land ; and Rural Out-migration in the Southern Ecuadorian Andes; World Development Vol.37 ; No.2 pp.457-468;www.Elsevier.com.
- [9] Anderson F and Jock R. [2002] Risk in Rural Development : challenges for managers and Policy Making. Rural Development department; World Bank.
- [10] Lu M. [1998] Analyzing Migration Decisionmaking : Relationships Betwe Residential Satisfaction, Mobility Intention, and Moving Behaviour, Environment & Planning A. :1473-1495.
- [11] Dixon H. [1995] Urban Growth and violence www.liharary.utoronto.ca/orban.

ARTICLE

THE IDENTIFICATION AND ANALYSIS OF THE EFFECTS OF THE RURAL HADI PROJECT IN RURAL AREAS (CASE STUDY: JULAKI RURAL DISTRICT OF JAYEZAN CITY IN OMIDIYEH)

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ABSTRACT

Important steps that have taken place in the field of the development of rural areas in recent years in Iran are the preparation and execution of the rural Hadi project as the primary means of directing construction in the villages. The villagers would benefit from the increase of service facilities by the execution of Hadi project, and it increases the villagers' interest to continue living in the village and as a result, it has a significant impact on reducing the rural-urban migrations. This study has been performed with the aim of identifying and analyzing the effects of the execution of Hadi project in order to investigate its physical effects on Julaki rural district of Omidiyeh. The research method is practical in terms of goal and it is based on descriptive-analytical method and the gathered data is based on a field study of the sample villages. The data is gathered by using documents from libraries, universities, municipalities and seats within the range. The data are also analyzed using the (SPSS and GIS software). EXCEL software and TOPSIS formula are used for drawing on diagrams and statistical tables. Every head of the household from villages of Julaki rural district with more than 200 inhabitants are selected as the sample population (n=405) in those locations that the project is implemented and completed by the end of 2010. 120 individuals are selected through random sampling by using single-sample t-test and TOPSIS method.

INTRODUCTION

KEY WORDS

Rural Hadi project,
developmental impacts,
Omidiyeh

The importance of the village becomes clear when we accept villages as the mother of cities and accept that the food that consumes cities are produced in the village and know that the development of the village will lead to the development of the city and the world will develop with the development of the city. But how do we develop the village?

Awareness about the village is not possible without knowing its infrastructures, nor would the knowledge of its infrastructures be possible without their historical review. The rural Hadi project is the most important tool in the administration of the rural development in Iran that considers the physical aspects of villages rather than their other aspects. This project provides the context for the revitalization and leading of the village in terms of its social, economic and physical dimensions [1]. Following the preparation and execution of the urban development plans in the 1961 decade, preparation and execution of rural construction plans has begun since the mid-1971 decade. After the revolution of 1978 and after the establishment of the organizations such as Jihad construction and the housing foundation. Firstly, the rural development is in the form of agricultural individual project and services such as construction of roads, bridges, canals, schools and clinics[2]. Hadi projects include projects that are developed and implemented for providing the field of rural development and construction that the foundations of these projects have been implemented in the country since 1983 and under the ministry of housing and urban development and in later years, especially since 1987, they have been followed more seriously by the housing foundation of Islamic revolution. The physical structure of villages which has been formed over time and according to different requirements have changed by the execution of the rural Hadi project and by building new constructions, widening streets, creating parks and green areas, creating places such as educational, medical, military and the police force, and they have led to relative prosperity and enhancement of the sense of security in villagers, as a result, they have an impact in reducing rural-urban migrations. The rural settlements in our country have been naturally developed and formed based on the needs of human societies living in them, so the formation and development of villages has not been performed based on proper planning and they have had no identity and birth certificate before the rural Hadi projects. The importance of preparation and execution of rural Hadi projects could give identity to the villages as cross sectional projects have a significant impact on one of the rural developmental projects so as to improve the economic, social and cultural conditions and especially the improvement of their physical aspects. Other factors that have always affected the villages in Iran and the Julaki village, are the migrations of the young and creative people for reasons such as searching for a better job, the higher quality of life and the higher incomes and this bitter reality impede the progress of villages and even their surrounding cities, and because of the migration of these people, not only the villages will not progress and would be empty of the young and creative people, but also living in the surrounding towns adds problems such as the creation of false jobs which would reduce the quality of life in cities. Giving a just attention to our country villages would lead to the right solution. Since the improvement of the quality of life in different dimensions of the rural life would lead to feeling of comfort in those locations, not only would they not be away from their home villages; but also, it would lead to the return of the refugees to their villages. Thus, the rural environment would become a place that the urban people would be willing to

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live in[3]. Among the factors that could affect the quality of life of the villagers are the preparation and the execution of the rural Hadi project. Due to this factor, in this study the amount of the impact of the preparation and the execution of the rural Hadi projects would be measured by selecting villages of the Julaki section of Omidiyeh in order to find proper solutions to increase the quality of life and the quality of the preparation and execution of the rural Hadi project in the villages, thus we encounter three basic points in this article:

The execution of the rural Hadi project can be effective on improving the parameters of a sustainable rural development.

The execution of the rural Hadi project has been effective on reducing migration of the villagers and on increasing their satisfaction.

And by using TOPSIS model, the rank of the villages under the study would be based on the satisfaction of the transition effect and on the execution of the rural Hadi project and on the satisfaction of reducing the villagers' migration in the best way.

Studies during the last century, specifies weakness in local and regional planning as a factor of slow development in Iran. The rural development is one of the fundamental aspects of the national development. Researchers emphasize that preparation and adjustment and execution of the rural developmental planning will be done in a desirable form if governments would have a strategic intervention [4].

Among the government actions of the Islamic Republic toward the rural development is focusing on the villages' structure which will be done through the rural Hadi project that comes from the urban Hadi project. The definition of the housing foundation of the rural Hadi project: The rural Hadi project is a project that determines the amount and possibility of extending in the future and how to use land for various purposes such as residential, commercial, agricultural, units and equipment and rural basic needs in addition to organizing and modifying the existing tissue. By implementing Hadi projects, Villages are changing not only environmentally, but also physically, socially and economically. Now, after 20 years of preparation and execution of the rural Hadi projects, identification of their execution performance in various aspects, is an important issue that on the one hand, it can specify its consequences in the villages and on the other hand, it can provide the necessary information for a better management by identifying its existing strengths and weaknesses [5].

The villages located in the Omidiyeh are one of the rural country areas that Hadi project has reached its stage of completion and execution. This is located in the southeast of Khuzestan province. Limited from north to Ramhormuz, from south to Hendijan, from east to Behbahan and partly to Kohgiluyeh and Boyer-Ahmad province and from west to Bandar-e Mahshahr. Identifying and analyzing the effects of Hadi project execution to improve the villagers' quality of life can lead to successful rural management.

MATERIALS AND METHODS

This is an applied research in terms of goal. In terms of data collection, it is a kind of survey research which has two types: 1. Descriptive 2-Analytical; therefore, collecting information has been done through objective observation from the sample population. The research approach is also a combination of (questionnaire, library, interview and review and field observations) which has been obtained from different sources.

The methodology in this study is the type of identification after the execution which investigates the effects of sustainable developmental indicators of the studied villages and the realization of their goals.

Gathering and collecting data and information

A) Documentary and library study, archives of local newspapers and magazines, online resources to identify and to develop concepts and frameworks and studying the literature of the topic and the statistics, information which are needed.

B) Field observations: The direct observation of the studied areas to obtain information from people and executives and the relevant experts in order to identify bottlenecks and problems and to provide solutions.

Information analysis methods

The data will be analyzed using SPSS and geographic information system GIS soft wares and finally, the results will be provided in the forms of tables, graphs and maps.

The statistical population and sample size of the research

The statistical population includes every head of the households of villages with more than 200 households in Julaki rural district of Omidyeh which Hadi project is executed and completed in those areas by the end of 2010.

Three groups were selected for questioning and interviews in order to study the effects of the execution of the rural Hadi project and to investigate the different opinions about these plans in the field studies.

The first group: Residents from the villages under study with more than 200 households (Ab Baran-e 2 village, 266 families, with a population of 1080) and (Eslamabad, 379 families, with a population of 1582) and (Sar Joulaki village, 235 families, with a population of 1013). The total population of Julaki rural district in year 2011 was about 1602 people.

The second group: Local authorities (Islamic councils from three villages).

The third group: Three authorities were interviewed who belonged to the rural Hadi project in the housing foundation of Omidyeh. By using SPSS software, the obtained data were coded and extracted and then they were analyzed.

The estimation of the sample size

In terms of statistical population, all members of the Islamic council and rural managers of three villages will be interviewed; however, Cochran's sampling method was used with 95% confidence level and 5% probability of error in order to determine the sample size of the head of households and it was performed as a simple random sampling.

According to these matters, in this study, to obtain the standard deviation of the desired attribute in the statistical society as well as to determine the probable accuracy for society, a sample of 10 people were randomly selected and the standard deviation of the desired attribute was obtained. The obtained standard deviation is equal to 0.84. According to Cochran formula, the number of the samples under investigation in this research for delving into studies was 120 people who were questioned.

RESULTS

The author used descriptive statistics such as mean, standard deviation, to excess the testable and minimum and maximum score and then to attempt to evaluate the data and variables analytically by using one-sample t-test and TOPSIS method in order to test the research hypotheses and the results of the entire population.

Descriptive findings

According to the [Table], the average total impact of satisfaction with the effectiveness of the execution project is equal to 3.46. Among the research items in the satisfaction section, the lowest average belongs to the library index with an average of 2.02 and the standard deviation of 0.320 and its highest belongs to water distribution index with an average of 4.62 and the standard deviation of 0.567. The total degree of satisfaction from the performance of the execution of the rural Hadi project is equal to 3.30. Among the research items in the section of the degree of satisfaction from the performance of the execution project, the lowest average belongs to the satisfaction index with the effectiveness of the project on the environment with an average of 2.42 and the standard deviation of 0.862 and its highest belongs to the satisfaction of the effectiveness of Hadi project in the creation of no motivation for migration with an average of 3.74 and the standard deviation of 1.04.

Table of the degree of satisfaction with the effectiveness of the execution of the rural Hadi project and the performance of the project in the studied villages

Row	Performance	The degree of satisfaction with the effectiveness of the execution of the rural Hadi project					Standard Deviation	Mean
		Very Low	Low	Average	High	Very High		
1	Water Distribution	1.7	1.4	2.7	20.3	73.9	0.567	4.62
2	Library Construction	27.6	39.6	12.5	8.4	11.9	0.320	2.02
Total		8.3	11.2	18.1	30.7	31.7	0.544	3.46

Row	Performance	The degree of satisfaction with the performance of the execution of the rural Hadi project					Standard Deviation	Mean
		Very Low	Low	Average	High	Very High		

		Very Low	Low	Average	High	Very High		
1	Are you satisfied with effectiveness of Hadi project on the environment?	11.2	15.3	35.7	12.8	25.0	0.862	2.42
2	Are you satisfied with the effect of the project on the creation of no motivation for migration?	10.1	8.6	10.3	32.4	38.6	1.04	3.74
Total		9.9	15.7	20.3	25.2	28.9	0.535	3.30

Analytical Findings

The first hypothesis: The execution of the rural Hadi project in rural settlements could affect the improvement of sustainable rural developmental indicators.

According to [Table 4.1], the average responses to the components of the execution of the rural Hadi project in rural settlements is equal to 3.46 that shows the focus of the responses is far from number 3 which represents an immense difference between the average of sample and the amount of test 3, and according to contents of the table of results, the achieved value of the significance level is smaller than the error level of $\alpha=0.5$ and the upper bound of the achieved confidence interval for the difference between the mean of society and the test value is positive and at least this difference is equal to 0.665. Therefore, the first hypothesis is accepted.

Table 4.1: Comparison of the average testable scores in one sample t-test

Number	Mean	Standard Deviation
120	3.46	0.554
Statistic T	Degree of freedom $\delta\phi$	The significance level
4.11	119	0.000
The difference between the mean and the test value	0.95 confidence interval for the mean difference and the test value	
	Lower bound	Higher bound
0.665	0.449	0.880

The second hypothesis: It seems that the execution of the rural Hadi project would be effective on reducing the rural-urban migration and on increasing the satisfaction of the villagers from the village environment.

According to [Table 4.2], the average responses to the reduction components of the villagers' migration in rural settlements is equal to 3.30 that represents the focus of responses is far from number 3 which represents an immense difference between the average of sample and the amount of test 3, and according to the table, the achieved value of significance level is smaller than the error level of $\alpha=0.5$ and the achieved confidence interval bounds for the difference between the mean of society and the test value is positive and at least this difference is equal to 0.482. Therefore, the second hypothesis is accepted.

Table 4.2: Comparison of the average scores of the testable in one sample t-test

Number	Mean	Standard Deviation
120	3.46	0.554
Statistic T	Degree of freedom $\delta\phi$	The significance level
3.13	119	0.000
The difference between the mean and the test value	0.95 confidence interval for the mean difference and the test value	
	Lower bound	Higher bound
0.482	0.316	0.647

The third hypothesis: The studied villages can be ranked in the best way based on their satisfaction with the effectiveness and the execution of the rural Hadi project and on the satisfaction of the rural migration reduction using TOPSIS model.

One of the multi-criteria planning methods is TOPSIS method which was introduced in 1981 by Hwang and Yoon. The idea of this method is to sort out priorities based on the similarity with an ideal: A choice has a better rating if it would be closer to the positive ideal and it would be further away from the negative ideal. The positive and the negative ideal: Which has the best and the worst value in all indicators that we call (A^+) and (A^-). This hypothesis, takes advantage of TOPSIS or ranking preferences method based on its similarity to the ideal and entropy response for ranking villages of Julaki rural district of Jayezan city functions in Omidiyeh (Ab Baran-e 2, Eslamabad and Sar Joulaki villages) based on the criteria of "satisfaction with the effectiveness and the execution of the rural Hadi project and the satisfaction in reduction of the rural migration".

This research identifies and analyzes the effects of the execution of the rural Hadi project in rural areas of Julaki rural district of Jayezan city functions of Omidiyeh in the 2010-2011 by using one-sample t-test and TOPSIS method, and the following results are obtained:

The first hypothesis: The execution of the rural Hadi project in rural settlements could affect the improvement of sustainable rural developmental indicators.

According to [Table 4.1], the average responses to the components of the execution of the rural Hadi project in rural settlements is equal to 3.46 that shows responses are far from number 3 which represents an immense difference between the average of sample and the amount of test 3, and according to contents of the table of results, the achieved value of the significance level is smaller than the error level of $\alpha=0.5$ and the bounds of the achieved confidence interval for the difference between the mean of society and the test value is positive and at least this difference is equal to 0.665 and therefore, the first hypothesis is accepted and because the mean of the responses is more than the average limit which means the majority of the testable items have chosen too many and too much options and because of the positive minimum difference between the mean of society and the test value, we conclude that the degree of satisfaction with the effectiveness and execution of the project in the studied area is high.

The second hypothesis: The execution of the rural Hadi project could be effective in reducing the rural-urban migration and in increasing the satisfaction of the villagers from the village environment.

According to [Table 4.2], the average responses to the reduction of the components of the villagers' migration in rural settlements is equal to 3.30 that shows the focus of the responses is far from number 3 which represents an immense difference between the average of the sample and the amount of test 3, and according to contents of the table of the results, the achieved value of the significance level is smaller than the error level of $\alpha=0.5$ and the achieved confidence interval bounds for the difference between the mean of society and the test value is positive and at least this difference is equal to 0.482 and thus, the second hypothesis is accepted and since the mean of the responses is more than the average limit which means the majority of the testable items have chosen too many and too much options and because of the positive minimum difference between the mean of society and the test value, we conclude that the effectiveness of the execution of the rural Hadi project in the studied area on reducing the rural-urban migration and an increase in the villagers' satisfaction from the village environment is high.

The third hypothesis: The studied villages can be ranked in the best way based on the satisfaction with the effectiveness and the execution of the rural Hadi project and the satisfaction of the rural migration reduction using TOPSIS model.

According to the results obtained from the entropy part that is shown in the table below, the impact of the most important indicator on the studied villages is found as the satisfaction with the effectiveness and the execution of the rural Hadi project which according to the calculated weight of 0.6, it can be said that 0.6% of the individual's satisfaction in the village is dedicated to the effectiveness and the execution of the rural Hadi plan. Also, according to the calculated weight, the satisfaction of the rural migration reduction is in the second place with the weight of 0.3.

Table 5.1: Calculation of the values and quantities of the entropy method and the weights of indicators

The satisfaction of the rural migration reduction	The satisfaction with the effectiveness and the execution of the rural Hadi project	Indexed statistics
0.999	0.998	E_i
0.001	0.002	D_i
0.3	0.6	W_i

Continuing with TOPSIS method, the studied villages are ranked based on the relative closeness to the ideal solution (R_i) that among these, according to the following table: $R_2 > R_1 > R_3$. According to experts, most villagers' satisfaction with the effectiveness and the execution of the rural Hadi plan and rural migration reduction is on the option A_2 which means Eslamabad village and then on the option A_1 means Ab Baran-e 2 village and at the end on the option A_3 which means Sar Joulaki village. Therefore, the third hypothesis is accepted.

Table 5.2: Calculation of the values and quantities of the entropy method and the weights of indicators

Rank	R_i	d_i^-	d_i^+	Options
2	0.995	0.012	0.000049	Ab Baran-e 2
1	1	0.024	0	Eslamabad
3	0	0	0.024	Sar Joulaki

CONCLUSION

Analyzing the results of the descriptive statistics show that the mean of the total satisfaction with the effectiveness of the rural Hadi project is equal to 3.46, that is in good condition in terms of rank. Also the mean of the total satisfaction with the performance of the rural Hadi project in the studied villages is equal to 3.30, that is in good condition in terms of rank. Thus, the following results are obtained in the inferential statistics using one sample t-test and TOPSIS method: According to the first hypothesis, the execution of the rural Hadi project in rural settlements could affect the improvement of sustainable rural developmental indicators. On the other hand, the degree of satisfaction with the effectiveness and the execution of the project in the studied area is high and according to the second hypothesis, the execution of the project could affect the reduction of rural-urban migration and the increase of the satisfaction of the villagers from the village environment. Also its effectiveness in the studied area could affect the reduction of rural-urban migration; therefore, the increase of the villagers' satisfaction with the village environment would be high. On the other hand, by using TOPSIS model, the villages under study can be ranked based on the satisfaction of the transition effect and the execution of the rural Hadi project and the satisfaction of reducing the villagers' migration in the best way. The villagers' satisfaction with the effectiveness and the execution of the rural Hadi plan and the reduction of rural migration is mostly in Eslamabad village and then in the Ab Baran-e 2 village and at the end in Sar Joulaki village.

CONFLICT OF INTEREST

Authors declare no conflict of interest.

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REFERENCES

- [1] Azimi Nural-Din J, Mojaver M. [2005] The Physical Effects of the Implementation of the Rural Areas (Case Study: West of Gilan), *Fine Arts*. 32(2):34-35.
- [2] The Seat of Jayezan in Omidiyeh, Khuzastan [2016].
- [3] The Revolutionary Housing Foundation, Institute of Natural Disasters. [2009] Evaluation of the Rural Master Plan.
- [4] Anabestani AA. [2009] The Physical Impact of the Assessment Plans in Rural Areas (Case Study: Villages in West of Khorasan).
- [5] Institute of Natural Disasters. [2009] Evaluation of the Rural Master Plan, The Islamic Revolution Housing Foundation of Tehran.

ARTICLE

ANALYTICAL STUDY OF DIFFERENT DIMENSIONS OF PROCESSING AND COMPLEMENTARY INDUSTRIES IN SOME RURAL AREAS OF BAVI

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ABSTRACT

The development of industries in rural areas of the country leads to job creation and absorption of surplus labor force in the agricultural sector, causes foreign exchange increase, and the increase of exports to the country. This study was conducted aim to study different dimensions of processing and complementary industries analytically in some rural areas of Bavi in 2016. The method was descriptive-analytical with questionnaire. The population was rural residents of Bavi from Weis rural district, who were 23834 people, and the sample size was determined as 180 people using Cochran formula. Univariate t test was used to examine the research hypotheses and to analyze the specific questions related to them. Finally, data analysis was performed using analytical software spss. The results indicated that the functional assessment of the development of rural industries in villages of Weiss rural district has had relative and moderate influence in the rural development of the region. In other words, the positive effects of industrial development in villages have not been so pervasive and substantial, and negative environmental effects in spite of the relativity of the results have significantly increased compared to the past. The results also showed that the effect of the development of rural industries in the studied area is average regarding economy.

INTRODUCTION

One of the biggest challenges of the present and the future in rural areas is creating the required jobs for surplus and displaced labor force from the agricultural sector. Inability of the agricultural sector in absorbing surplus labor and the provision of adequate income has led to an influx of rural migrants to the cities. Thus, creating job opportunities and income, especially for rural low-income groups, is a necessity. In this regard, one of the most important issues that have attracted the attention of politicians, thinkers, and researchers is the need to develop processing and complementary industries.

This study evaluates the effects of establishment and development of processing industries on various environmental-economic and social aspects, comprehensive development of the rural community, as well as the necessity of planning for the establishment of complementary and processing industries and development prospects in Weis rural district of Bavi, especially in the agricultural sector. In the following lines, some of the studies done in this field in Iran and abroad are discussed.

Industries that convert agricultural and livestock products into semi-finished or finished goods are called processing industries. This industry is considered as one of the most important fields of agriculture [1].

One of the most important rural industries is agricultural processing industry. Undoubtedly, the establishment of processing industries is one of the most beneficial linkages between agriculture and industry. In this regard, the experience of the past three decades of Asian countries, especially China, India, and South Korea shows that the processing-complementary industries of agricultural sector play a fundamental role in these countries' rural development [2]. This is to a degree that agricultural processing in India has been taken into consideration as a huge potential for economic and social development [3].

The establishment of processing industries in the village leads to thriving of agricultural sector and production of products similar to that of processing industries produced by the villagers and this has improved the status of their income [4]. The absence of processing industries in the villages as the reason of the decline in income of the villagers and the reason of increased rural to urban migration [4].

In another study, it was shown that processing industries preserve and maintain agricultural and food products for a long time and lead to job creation and increase in value added from export [3].

The establishment of complementary and processing industries could play an important role in reducing poverty, unemployment, immigration, and in increase of employment growth [2].

With the establishment of industry in rural areas, besides increase in household income, food consumption patterns, and durable goods have significantly experienced major changes [5].

The agricultural processing industry is advantageous for farmers from the perspective of generating income and employment: first through the purchase of agricultural products by agricultural processing industry and second, through the employment of the poor in factories of agricultural processing industries [6].

KEY WORDS

village, agriculture, employment, processing-complementary industries, development, Weis rural district

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Agricultural processing industries increase employment opportunities, income levels, overcome the challenges of poverty and unemployment, and overall lead to rural development [7].

MATERIALS AND METHODS

This study is applied, regarding the research methodology, it is descriptive-analytical, and method of data collection is library and field. In the library method, data is collected through books, organizations documents, articles, archives of organizations, and various scientific websites. The second method is field studies and interviews where field studies are carried out through the preparation of the questionnaire and the classification.

The population of the study is households of Weis rural district of Bavi as 23834 people [8]. Cochran's formula was used to determine the sample size. Cochran's formula is one of the most widely used methods to calculate the sample size. In this formula, (n) is the sample, (N) is population size, (z) is the value of normal variable of the standard unit 1.96 at 95 percent level of confidence, (p) is the proportion of the population with a certain trait. Moreover, (q) is the proportion of the population lacking the certain trait (if the values of p and q are not available, one can consider it as 0.5), and (d) is the allowable error that is usually equal to 0.01 or 0.05.

$$n = \frac{z^2 p q}{1 + z^2 p q}$$

Therefore, using Cochran's formula to determine the sample, the sample size was determined as 188 households. The questionnaires were distributed, completed, and gathered with the help of researchers. In order to achieve the desirable validity of the questionnaire, it was revised using the comments of the supervisor, faculty members, and consulting with experts informed on issues related to the research topic, and finally the validity and the questionnaire being standard was confirmed.

In order to achieve the validity of the questionnaire using the Comments of Supervisor and faculty members, consulting with experts informed on issues related to the research topic, the questionnaire was modified. Finally, standardized questionnaire and its validity were confirmed.

To test reliability of the 20 items scored on Likert scale, Cronbach's alpha was used, and as the calculated value is close to 0.7, the questionnaire is reliable. The Cronbach's alpha was obtained as 0.93, indicating the reliability of the questionnaire.

Independent variables of this research were agricultural complementary-processing industries, and the dependent variable was positive socio-economic and social effects.

Data analysis and hypothesis testing were done using SPSS 20 in descriptive (frequency, mean, standard deviation) and inferential methods statistical methods such as Chi-square test and Pearson and Spearman correlation analysis.

RESULTS

Camel descriptive findings

Based on the results of the questionnaire, 69% of the respondents were married and 31% were single, 67% of the respondents were male and 33% female, 39% were illiterate, 62% had elementary education, 65% had diploma, 4% bachelor and above. Of the respondents, 69% were farmers, 6% employees, 17% workers, 8% were self-employed, 6% of the respondents have a monthly income of less than 500 thousand tomans, 12% have 500 thousand to 650 thousand, 30% from 650 to 850, and 52% over 900 tomans.

Analytical findings

[Table 1] shows the values of the impact of economic indices on establishment of agricultural complementary-processing industries in the studied region. According to this table, mean and standard deviations for income, jobs creation, and investment are 3.34 ± 0.68 , 3.21 ± 0.51 , and 2.96 ± 0.362 , respectively. The increase in diversity and revenue opportunities for the villagers with an average of 3.33, the increase of changes in the type of crops to local industries of the village with an average of 3.21, increase in industry revenues in the villages with an average of 3.08 have more effect on villagers' life compared to other social aspects. Moreover, creating new employment opportunities for villagers with an average of 3.38 and utilization of surplus labor of the villages with an average of 3.04, and development of road facilities such as mosques, restaurants, and so on with an average of 3.67 are more effective.

Table 1: The values of the impact of economic indices on the creation of agricultural complementary-processing industries in the studied area

Variable	Item	Mean	SD	t statistic test
Creating revenue	Increasing industry revenues in the villages	3.08	1.077	18.229
	Private sector investment in rural areas	3.09	0.692	12.636
	Increase the variety and revenue opportunities for villagers	3.33	0.327	3.103
	The possibility of selling crops and livestock industries easier	3.11	1.106	24.491
	Changes in the type of crops to increase local village industries	3.21	0.212	4.187
Job creation	Use of rural surplus labor	3.04	0.664	6.60
	Creating new job opportunities for villagers	3.38	0.375	3.34
Investment	Quantity and quality of transport networks between rural development	3.00	1.000	18.89
	Development of road facilities such as mosques, restaurants and ...	3.67	1.673	34.71
	Improving the quality of rural services (water, electricity, gas ...)	2.56	-0.442	-6.250
	Development of IT infrastructure communication (telephone, mobile and internet ...)	2.47	-0.529	-7.320
	Development of facilities and services such as mechanical and electrical work ...	3.11	0.106	1.940

The value of impact of social factors on creating agricultural complementary-processing industries in the studied area is presented in [Table 2]. Based on these results, mean and standard deviation for the participation and rural migration are 3.4 ± 0.41 and 2.7 ± 0.596 respectively. Increase of the people's residence in the village with an average of 3.44 is effective compared to other options.

Table 2: The values of impact of social indices on creating agricultural complementary-processing industries values in the studied area

Variables	Item	Mean	SD	t statistic test
Participation	Interest of villagers to work in rural industries	3.44	0.442	4.835
	More activity of rural cooperatives	3.36	0.356	3.920
	Increased rural population cooperation with state institutions responsible for the industry	3.42	0.433	3.364
Immigration	Increase in the shelf life of the people in the villages	3.44	0.442	5.566
	Accepting immigration from outside the village	1.96	-1.038	-11.467

The values of the effect of physical indices on creating agricultural processing-complementary industries in the studied area are presented in [Table 3]. Based on these results, the mean and standard deviation for physical changes and quality of access are 2.52 ± 0.456 and 3.37 ± 0.38 , respectively. Improving the quality of rural roads (curbing, Chipseal, and so on) with an average of 3.41, and communication infrastructure development of roads with an average of 3.35 is more effective than other items.

Table 3: The values of the effect of physical indices on establishing industrial complementary-processing industries in the studied area

Variable	Item	Mean	SD	t statistic test
Physical changes	Recovery and rehabilitation of rural housing	2.342	0.389	-8.895
	Construction development in rural areas	2.524	-0.475	9.815
	Improving the quality of rural homes	2.674	0.492	9.948
	Increasing rural architecture changes	2.535	-0.468	-9.948
Access quality	Improving the quality of rural roads (curbing, Chipseal, and so on)	3.41	0.413	3.653
	Development of infrastructure for roads	3.35	0.346	3.233

In [Table 4], the value of the impact of environmental factors on creating agricultural processing-complementary industries in the studied area is given. The results showed that the mean and standard deviation for environmental degradation and environmental pollution are 3.52 ± 0.62 and 3.24 ± 0.82 , respectively. Unplanned construction with an average of 4.14, improving methods of waste disposal with an average of 3.87, increased destruction of vegetation due to the establishment of industries in the region and increase of the destruction of vegetation due to the establishment of industries in the region with an average of 3.86 are more effective than other items.

Table 4: The values of the impact of environmental factors on creating agricultural processing-complementary industries in the studied area

Variable	Item	Mean	SD	t statistic test
Environmental destruction	Unplanned construction	4.14	-0.144	14.940
	Increased land use changes in farms and gardens	2.43	0.433	7.976
	Increasing destruction of natural beauty	3.79	0.788	9.944
	Increased destruction of vegetation due to the establishment of industries in the region	3.86	-0.144	-0.996
	Increase in wildlife habitat destruction with the development of rural industry	3.40	-1.596	-33.015
Environmental pollution	Increased water pollution	3.55	0.546	8.996
	Village atmosphere odor pollution by industries	3.05	0.452	6.264
	Increased discharges to surface water sources and so on	3.86	0.856	13.227
	Improved methods of waste disposal	3.87	-1.135	-16.929
	Noise pollution caused by industrial units	1.88	-1.125	-18.102

CONCLUSION

According to the study, the economic variable average in the studied area is 3.60, and the t value obtained for comparing this mean with three is less than 0.05. Thus, the hypothesis denoting the lack of difference of the mean with three and considering the confidence interval values obtained that contains positive numbers, it could be said that the mean is significantly higher than three. Therefore, the mean of the variable is significantly higher than three, and it is concluded that that in order to create new jobs, to increase in investment, and to decrease unemployment in the studied region, establishing and development of processing industries seems essential. The results are consistent with findings of [9], [7], [10] confirming that the findings are inconsistent with the findings of the research by [11] and [8]. Moreover, according to the results, social variable mean is 3.15, and the t value obtained for comparing this mean with three is less than 0.05. Thus, the hypothesis denoting the lack of difference of the mean with three and considering the confidence interval values obtained that contains positive numbers, it could be said that the mean is significantly higher than three. Therefore, the mean of the variable is significantly higher than three, and it is concluded that creating and development of processing industries new jobs have been effective in increasing the role of rural women in economic activities and the development of the studied area and it is acceptable. This finding is consistent with findings of [7] and inconsistent with the results [12].

Moreover, considering that the environmental variable mean in Weiss rural district was 3.03, and given the confidence interval obtained that includes negative numbers, it can be argued that the mean is significantly less than three. Thus, in order to protect agricultural lands, pastures, and plant species, reducing the detrimental environmental impact and the development of processing industries seem essential in the studied area. The result obtained are consistent with the findings of [13], [14], and inconsistent with the results of [12].

According to the study findings, the mean obtained for investments is 3.07, and the value obtained for comparing this mean with three is less than 0.05. Thus, considering the confidence interval values obtained that contains positive numbers, it could be said that the mean is significantly higher than three. Therefore, the mean of the variable is significantly higher than three, and in order to increase the time of preserving and exports of agricultural products in the studied area, the development of processing and complementary industries seems necessary. The results are consistent with the findings of [3], [10] and aligned, and are not consistent with the results of [15].

CONFLICT OF INTEREST

Authors declare no conflict of interest.

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REFERENCES

- [1] Darban Astaneh P. [2004] concepts and principles of organization of industries in rural areas, municipalities and RMs Publishing Organization of Iran, Tehran.
- [2] Kalantari K. [2010] regular models and promoting sustainable agricultural development and education, Ministry of Agriculture.
- [3] Cachru W. [2011] Spatial Organization in Rural Areas, New York: Prentice-Hall publisher.
- [4] Naderi M. [2014] management problems of small towns, municipalities Magazine. 28.
- [5] Rizwanul I. [1994] Rural Industrialization: An Engine of Prosperity in Postform Rural China, World Development. 22(11):1643-1662.
- [6] Liedholm C. [1989] The Role of Non – Farm Activities in the Rural Economy, the Balance Between Industry and Agriculture in Economic Development, Macmillan Press. 427.
- [7] Shibani HR. [1998] the role of establishment of small industries in economic development and spatial order of rural areas, case study: town of Javad Abad Varamin Shahid Beheshti University, Master's Thesis.
- [8] Statistical Center of Iran. [2011] detailed results of the General Census of Population and Housing.
- [9] Taherkhani M. [2001] rural industrialization, the cornerstone of the future strategy Rural Development, Ministry of Agriculture, General Administration of industrial design and productivity, Tehran.
- [10] Nasiri Y. [2009] developed and undeveloped countries, Enteshar Company.
- [11] Taghdisi A. [2007] the feasibility of the establishment of rural industries, agro animal products in Ilam province, Journal of Geographical Studies. 6.
- [12] Rezvani MR. [2010] an analysis of the socio-economic effects of industrial areas in the development of rural areas: Solomon Abad Industrial Area Branch, Geography and Development.
- [13] Motiyi Langroodi SH, Najafi Kani R. [2012] socio-economic impacts of rural industrial zones, industrial parks, Mashhad, Geographical Research. 16(61).
- [14] Papeli Yazdi F, Ebrahimi G. [2011] an analysis of the traditional partnership and its effects on rural areas of Iran (Case's method of rice cultivation in the village Falard District Chaharmahal and Bakhtiari Province).
- [15] Papeli Yazdi F, Ebrahimi G. [2012] economic geography, industry, publishing (SID), Mashhad.

ARTICLE

STUDYING THE EFFECTS OF AGRICULTURE ON SUSTAINABLE DEVELOPMENT IN SOME VILLAGES OF HAMIDIEH

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ABSTRACT

The aim of this study was to investigate the effects of agriculture on sustainable rural development indices in villages of Karkheh rural district, Hamidieh. The study method was analytical- descriptive using documents and field studies, and the population included villages of Chamim, Oudeh, Janadleh, and Albuid-e YekNabi. The sample size was estimated as 200 people based on Cochran's formula and was set according to Likert scale. SPSS software is used to analyze research data. The results showed that agriculture has a great effect on economic, social, and physical development of the villages under study. Results showed that agriculture has great effects on economic, social, and physical development of villages investigated. According to the results of analyzing the questionnaire findings with correlation coefficient test to analyze the effects of agriculture on indices of entrepreneurship and rural sustainable development in the villages studied, the total mean of quality of entrepreneurship in villages of Janadleh, Chamim, Oudeh, and Albuid-e YekNabi is 3.90, 3.83, 3.80, and 3.40, respectively. Finally, within the theoretical framework of the research, a significant relationship was observed between planting vegetable and entrepreneurship of villagers and vegetable cultivation and rural indices of sustainable development.

INTRODUCTION

Agriculture is usually the most important part in the economy of developing countries. Thus, economic development in these countries is closely related to the development of their agriculture. Agricultural growth can have a significant impact on poverty reduction, rural employment, increasing GDP, meeting the consumption needs of population, and gaining foreign exchange support for the country.

Moreover, with the expansion of human civilization, agricultural activities, given their structural nature, have been introduced as primary function in rural areas, and among other rural functions, such as residential, socio-cultural, political and economic functions, it is the most important economic function, particularly for countries lacking mineral resources [1]. Moreover, the immediate connection between the two phenomena of agriculture and rural development has caused agriculture and rural development concepts to be used interchangeably sometimes [2].

In the economic structure of rural areas in different countries, agriculture is considered as the basis of livelihoods and in most development programs, it is the single and most important pillar of the rural economy [3]. In fact, village and rural life are combined with agricultural activities, and agriculture has a key role in rural development activities. The agricultural sector, especially in developing countries, should serve as a tool for the sustainable rural development. Rural development, as a process of social, economic, and cultural change in the rural environment includes improving productivity, increasing rural employment and income, providing minimum acceptable levels of nutrition, housing, education, and health [4].

In Iran, a major part of the population is living in rural areas and their jobs are mostly agricultural jobs or activities related to it. Therefore, addressing issues such as food security, public participation in decision-making, as well as protection of biological resources, regardless of the agricultural sector is almost impossible [5]. On the other hand, one of the main pillars of sustainable rural development is attention and research in agricultural farming systems and as agriculture is considered as the most important part of the rural community activities, studying its dimensions is of the basic points on rural recognition and development. In other words, the agricultural sector of every rural community is based on operating systems forming that community and these systems could have a decisive role in sustainable rural development. Since development process itself is a function of domestic and foreign ecological, economic, and social factors development-process, its changes will affect agricultural structure [6].

In a study that was conducted by [7] for strategic planning to expand employment in rural and urban areas, it was shown that among 57 surveyed villages about 16 percent are at rich level, 40 percent average, and 44 percent are in underserved and deprived areas.

Moreover, the result of the study to develop employment in deprived and disadvantaged areas of Javanroud showed that aggressive strategy (SO), where the main focus is on internal strengths and external opportunities, is the most appropriate strategy to promote employment in villages at the two levels mentioned [7].

In a paper, [8] studied "The Role of Agricultural Entrepreneurship in Rural Development." Results showed that the diversification of the rural economy is not realized just by induction from the outside unless the entrepreneurs of rural areas identify potential opportunities and resources themselves, and by the efficient use of them bring about diversity of employment and the economy for rural areas.

KEY WORDS

Rural economy,
agriculture, sustainable
development,
entrepreneurship,
vegetable cultivation,
Karkheh rural district

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The results of the study entitled "An analysis of the effects of agricultural processing industries in rural development, case study: Seyedan, Marvdasht" showed that agricultural processing units in five economic, social, agricultural, physical, and environmental dimensions, except in the economic dimension from the rural people's perspective, and in other aspects and from the viewpoint of industry owners in all aspects have been more than average [9].

[10] studied "The role of agriculture in rural development in rural district Chaghanarges, Kermanshah." Their findings showed that the efficiency of agricultural production in rural district Chaghanarges arises from the following factors: a) traditional methods of agriculture, b) small lands, and c) low level of education and skills of beneficiaries. Moreover, there was a significant relationship between the development of agriculture and rural development in rural district Chaghanarges, so that agricultural development can be the basis for rural development. Examining the natural ability of the rural district also showed that regional agriculture has great capabilities for development.

[11] examined the role of agricultural products with an emphasis on saffron in rural- development in Kashmar, BalaVelayat District. The results showed that BalaVelayat District has a key position in terms of climate, water, and soil suitable for planting saffron at large scale.

[12] conducted a study entitled "The Role of Agriculture in Rural Development." The results showed that the agricultural sector is one of the most powerful sectors that supplies about a third of employment, more than four-fifths of the country's food needs, half of non-oil exports, the need of 4 million households, 0.9 of the industry need to crops, and one-fifth of GDP of the country.

[13] examined the project of conversion and complementary industries of agriculture and technology development of Bangladesh and the results led to offering solutions for conversion industrial development.

[10] states that in the economic boom of the West, especially Britain and France, agriculture has played a crucial role in providing food and labor power necessary for the fledgling parts of the industry in these countries.

[14] believe that protection payments to organic planting farmers play a key role in the process of accepting, continuity, and development of organic farming.

- In his research, [15] realizes the role of agriculture in Ghana's rural development on national security and regional stability.

- While seeing the development of agriculture with health and education of people, [10] states that poverty exists in rural area where the life of its inhabitants depends mainly on agriculture.

[16] stated that with the development of entrepreneurship in rural areas, the context for rural people's benefiting from access to goods and services increases and finally, economic growth and consequently rural development are realized.

- While seeing the development of agriculture with health and education of people, [10] states that poverty exists in rural area where the life of its inhabitants depends mainly on agriculture.

- In his book "Sustainable Development of Agriculture and Rural Development," [17] focuses on the relationship between these two issues and discusses the role of sustainable agriculture in rural development.

[18] studied the effect of industrialization on the economy and rural life in India. The results showed that industrial decentralization increases awareness, expands training, creates more investment in the agricultural sector, and increases in the income of low-income households.

According to the description and evaluation of the resources mentioned above, attention to the importance of agricultural effects on economic, social, and physical development of villages in Iran, the importance of this research in Hamidieh, and in form of case study in Karkheh, which has the most cultivated agricultural land, we were obliged to study the effects of agriculture on sustainable development in some villages of Hamidieh.

Hamidieh is in the southwestern Iran and its capital is HamidiehCity, which is extended from Karkheh River to Khuzestan plain. Its span is nearly 4762 square kilometers. Hamidieh is one of the major poles of Agriculture in Khuzestan that with fertile soil and sufficient water has provided suitable conditions for the cultivation of vegetables, legumes, and melons. Karkheh rural district, as the most important rural district of this city, is the largest area under vegetable crops cultivation.

MATERIALS AND METHODS

This study is applied research, in terms of research methodology, it is descriptive-analytical, and data collection tools are library and field. In library method, data is collected through books and documents of

organizations, articles, archives of various scientific organizations and sites, and the second method, was field studies and interviews, which will be conducted through the preparation of the questionnaire and finally the categorization and the analysis of field studies.

The population included villages of Chamim, Oudeh, Janadleh (SheykhTomeh), and Albuid-e YekNabi. According to the statistics of Rural Health Centers and the Statistical Center of Iran, the number of households in 2011 in these villages is 57, 240, 218 and 53 households with 568 households. Cochran's formula was used to determine the sample size. Cochran's formula is one of the most widely used methods to calculate the sample size where (n) is sample size, (N) is the population size, (z) is value of the value of the standard unit that in 95% confidence level is 1.96, (p) is the proportion of the population with a certain attribute, (q) is the proportion of the population lacking certain traits (if the amount of p and q are not available, it can be considered as 0.5, and (d) is the allowable error usually equal to 0.01 or 0.05.

$$n = ((z^2 pq) / d^2) / (1 + 1/N((z^2 pq) / d^2 - 1))$$

Therefore, using Cochran's formula for determining the sample, the sample size was obtained as 197 people that increased to 200 to increase accuracy. The questionnaires were distributed among the population and completed with the help of researchers.

Data analysis and hypothesis testing were done using statistical analysis software SPSS20 in descriptive method (frequency, mean, standard deviation) and inferential statistical method such as Chi-square test, Pearson and Spearman correlation analysis.

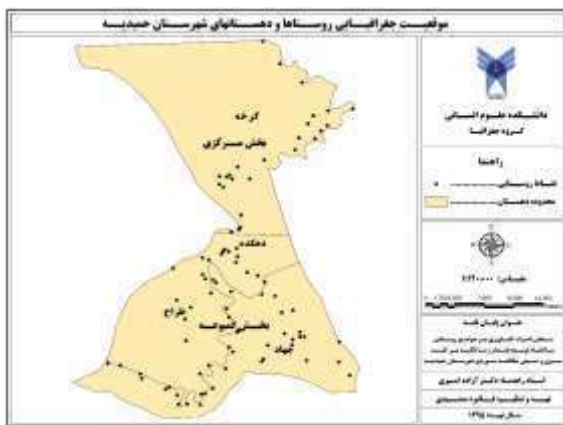


Fig. 1: Location map of the city of villages and rural district of Hamidieh.

RESULTS

Descriptive findings

All 200 questionnaires distributed were collected. Based on the results, 98.5 percent of respondents were men, and 1.5 percent of respondents were women. In terms of age, 7.5% of respondents were in the age group 16-24, 52.5% in group 25-33, 27% in the group 34-42 years, 8.5% in 43-51 years, and 4.5% in 52-60. In terms of level of education, 55.5% of the respondents had primary education, 32.5% guidance school, 10% high school, and 2% had higher education. In terms of location, 49% of respondents live in Jandaleh, 15 percent in Albuid-e Nabi, 25.5% in Oudeh, and 21 percent in Chamim. The products produced were vegetable in Jandaleh and Chamim, respectively as 4000, 3500 tons, and in Oudeh and Albuid-e Nabi, it was 3850 tons.

Based on the results of descriptive statistics, mean and standard deviation for entrepreneurial index in the villages of Jandaleh, Chamim, Oudeh, and Albuid-e Nabi are, respectively, 3.90 ± 0.18 , 3.83 ± 0.077 , 3.80 ± 0.07700 and 3.40 ± 0.00 . Regarding sustainable development index, the mean and standard deviation are, respectively, 3.78 ± 0.00 , 3.66 ± 0.009 , 3.64 ± 0.01 , and 3.57 ± 0.01 .

Examining the effects of entrepreneurship indicators in the villages studied

To evaluate the effects of entrepreneurship indicators in the villages studied the items "To what extent has agriculture been effective in creating employment in rural areas? To what extent has agriculture been effective in the diversification of employment in rural areas? Creating meaningful units will promote agricultural development in rural district of Karkheh. Holding technical courses for farmers will increase the knowledge of farmers and promote agriculture. To what extent has agriculture been effective in rural entrepreneurship?" Moreover, "open questions of the questionnaire" are used that are assessed with the

statements of [Tables 1 and 2]. The relative distribution of the responses to the items is given in the tables.

According to [Table 1], the mean of total effect of indicators of entrepreneurship is 4.20 that in terms of rating are in good condition.

Among the research items in entrepreneurship indicators, the lowest average belongs to items "To what extent has agriculture been effective in diversification of employment in rural areas?" with an average of 3.24 and SD of 0.542. Moreover, the highest belongs to the item "To what extent has agriculture been effective in creation of employment in rural areas?" with an average of 4.92 and SD of 0.264. According to [Table 2], which is related to open questions of the questionnaire, all subjects in the villages under study answered yes to the items "Are young people involved in agricultural farming? Are women and girls engaged in agricultural activities? Are the children working in agriculture?" and answered no to the items "Do you pack and sell vegetables? Do you dry and sell vegetables? Is there a vegetable firm in the area? Do you directly sell your greens?"

Table 1: The value of effect of indices of entrepreneurship in the villages studied

Row	Item	The amount of effect					SD	Mean
		Very weak	Weak	Average	Good	Very good		
1	To what extent has agriculture been effective in creating employment in rural areas?	0	0	0	7.5	92.5	0.264	4.92
2	To what extent has agriculture been effective in diversification in rural areas?	0	0	81.5	13.0	5.5	0.542	3.24
27	Creating purposeful units of agriculture will develop agriculture in villages in Karkheh.	0	0	11.5	88.5	0	0.319	3.88
29	Implementation of vocational and technical courses for farmers will increase the knowledge of farmers and agricultural promotion.	0	1.0	0.5	10.5	88.0	0.441	4.85
42	To what extent has agriculture been effective in rural entrepreneurship?	0	0	0	88.5	11.5	0.319	4.11
Total		0	0.2	18.7	41.6	39.5	0.178	4.20

Table 2: The value of effect of indices of entrepreneurship in the villages studied

Row	Items	The value of effect							
		Jandaleh		Albuid		Chamim		Oudeh	
		Yes	No	Yes	No	Yes	No	Yes	No
43	Are young people working in agriculture?	100.0	0	100.0	0	100.0	0	100.0	0
44	Are women and girls engaged in agricultural activities?	100.0	0	100.0	0	100.0	0	100.0	0
45	Are children engaged in agricultural activities?	100.0	0	100.0	0	100.0	0	100.0	0
46	Do you pack and sell your vegetables?	0	100.0	0	100.0	0	100.0	0	100.0
47	Do not attempt to dry out and sell your vegetables?	0	100.0	0	100.0	0	100.0	0	100.0
48	Is there a vegetable factory?	0	100.0	0	100.0	0	100.0	0	100.0
49	Do you attempt to sell your vegetables directly?	0	100.0	0	100.0	0	100.0	0	100.0

1. Studying the effects of indicators of sustainable development in the villages

To evaluate the effects of rural sustainable development indicators in the studied villages all the items of the questionnaire were used that were tested with the items in [Tables 3 and 4]. According to the data in Table 3, the mean of impact of sustainable rural development is 3.67 that has a good status in terms of ranking. Among the research items in sustainable rural development indices, the lowest average belongs to the index "avoiding fragmentation and land use change that is suitable for agriculture have led to the development of rural villages in Karkheh" with an average of 1.25 and SD of 0.687. The highest belongs to "To what extent has agriculture been effective in improving rural life?" with an average of 4.98 and SD of 0.172.

According to [Table 4], which corresponds to "open questions of the questionnaire," all subjects in the villages under study answered yes to the items "Are young people involved in agricultural farming? Are women and girls engaged in agricultural activities? Are the children working in agriculture?" and answered no to the items "Do you pack and sell vegetables? Do dry and sell vegetables? Is there a vegetable firm in the area? Do you directly sell your greens?"

Table 3: The impact of sustainable development indicators in the villages studied

Row	Items	The amount of effect					SD	Mean
		Very weak	Weak	Average	Good	Very good		
1	To what extent has agriculture been effective in creating employment in rural areas?	0	0	0	7.5	92.5	0.264	4.92
2	To what extent has agriculture been effective in the diversification of employment in rural areas?	0	0	81.5	13.0	5.5	0.542	3.24
3	To what extent has selling agriculture been effective in rural incomes?	0	1.0	11.0	1.0	87.0	0.689	4.74
4	To what extent have agriculture and related industries been effective in increasing the incomes of rural people?	0	1.5	9.5	12.5	76.5	0.716	4.64
5	To what extent have agricultural activities of villagers been effective in having access to low-interest agricultural loans?	0	79.0	19.5	1.0	0.5	0.477	2.23
6	To what extent has production of agriculture products been effective in income of rural people?	0	4.0	1.5	94.5	0	0.408	3.90
7	To what extent can export of agricultural products bring exchange into the country?	0	85.5	2.5	12.0	0	0.661	2.26
8	To what extent has the rise in prices of agricultural activities been effective in rural areas land and property price increase?	0	6.0	2.0	92.0	0	0.491	3.86
9	To what extent has the sale of agricultural lands been effective in increasing rural household income?	0	95.5	0.5	0	0	0.070	2.00
10	To what extent have agricultural activities in the region been effective in attracting investment?	0	0	89.0	11.0	0	0.313	3.11
11	To what extent can mechanization and the use of agricultural machinery help increase production?	0	0	0.5	10.5	89.0	0.335	4.88
12	To what extent is the use of agricultural machinery and mechanization of agriculture effective in increasing farmers' incomes?	0	10.5	0	0.5	89.0	0.992	4.68
13	Has diversification been effective in agricultural activities and the development of rural villages of Karkheh?	0	12.0	87.5	0	0.5	0.358	2.89
14	Diverse planting will improve the economic situation of rural farmers.	1.0	1.0	11.0	87.0	0	0.464	3.84
15	Avoiding fragmentation and suitable agricultural land-use change leads to the development of rural villages Karkheh.	87.5	0.5	11.0	1.0	0	0.687	1.25
16	Creating production cooperatives and agricultural processing industries could create jobs and increase rural incomes.	0	10.5	0.5	1.0	88.0	0.931	4.66
17	To what extent have bank loans of farmers been effective in the provision of agricultural machinery and equipment?	0	0	11.0	0.5	88.5	0.629	4.77
18	To what extent has agriculture been effective in providing education and health services?	0	2.0	97.5	0.5	0	0.157	2.98
19	To what extent has agriculture been effective in increasing social communication of people from village with people from the cities and surrounding areas?	0	0.5	0.5	99.0	0	0.157	3.98
20	To what extent has agriculture been effective in the villagers' access to telephone and Internet?	0	0	0.5	99.5	0	0.070	3.99
21	To what extent has agriculture been effective in increasing food quality of villagers?	0	0	0.5	99.5	0	0.070	3.99
22	To what extent has agriculture been effective in reducing migration from rural to urban areas?	0	0	0.5	99.0	0.5	0.100	4.00

23	In your idea, has development of the agricultural sector increased the rural participation in regional development?	0	0	1.0	1.0	98.0	0.222	4.98
24	To what extent has agriculture been effective in improving the lives of the villagers?	0	0	0.5	1.0	98.5	0.172	4.98
25	To what extent has agriculture been effective in the supply of essential commodities and rural welfare?	0	0	0.5	1.5	98.0	0.185	4.98
26	To what extent has agriculture been effective in the purchase of vehicles and rural welfare?	0	0	88.5	11.5	0	0.319	3.11
27	Creating targeted units will develop agriculture in the villages of rural district Karkheh.	0	0	11.5	88.5	0	0.319	3.88
28	Supporting educational institutions of the private sector will develop villages of Karkheh.	0	0.5	88.0	10.5	1.0	0.369	3.12
29	Implementation of vocational and technical courses for farmers will increase the knowledge of farmers and agricultural promotion.	0	1.0	0.5	10.5	88.0	0.441	4.85
30	Holding technical classes for the farmers will increase the knowledge of farmers and promotion of agriculture	0	0	2.5	11.5	86.0	0.434	4.83
31	In your idea, have agricultural activities affected increasing the level of education of rural households?	0	13.5	85.0	0.5	1.0	0.410	2.89
32	To what extent have agricultural activities been legal and prospective?	1.0	84.0	11.0	3.5	0.5	0.521	2.18
33	To what extent have mechanization of agriculture machinery been effective in improving the lives of farmers?	0	0	1.5	87.0	11.5	0.347	4.1
34	To what extent have revenues from sale of agricultural products been effective in improving the lives of the villagers?	0	0	3.5	96.0	0.5	0.198	3.97
35	To what extent have agricultural activities been effective in improving the physical status of villages?	0	0	89.0	10.5	0.5	0.335	3.11
36	To what extent have agricultural activities been effective in the provision of infrastructure services?	0	0.5	87.5	11.5	0.5	0.335	3.12
37	To what extent have agricultural activities been effective in improving rural buildings?	0	0.5	86.0	13.0	0.5	0.370	3.13
38	To what extent have agricultural development and increase of rural incomes been effective in the materials used in homes?	0	2.0	85.5	12.5	0.5	0.385	3.11
39	To what extent have agricultural activities been effective in the quality of materials used in buildings?	0	5.5	82.5	11.5	0.5	0.431	3.7
40	To what extent have agricultural activities been effective in road building?	0	6.0	93.5	0	0.5	0.279	3.95
41	To what extent has farming been effective in improving the condition of rural buildings?	0	6.5	82.5	11.0	0.5	0.432	3.06
42	To what extent has farming been effective in villagers' entrepreneurship?	0	0	0	88.5	11.5	0.319	4.11
Total		2.1	10.2	31.9	29.2	26.5	0.059	3.67

Table 4: The value of impact of rural sustainable-development indicators in the studied villages

Row	Items	The value of effect							
		Jandaleh		Albuid		Chamim		Oudeh	
		Yes	No	Yes	No	Yes	No	Yes	No
4	Are young people working in agriculture?	100.0	0	100.0	0	100.0	0	100.0	0
4	Are women and girls engaged in agricultural activities?	100.0	0	100.0	0	100.0	0	100.0	0
4	Are children engaged in agricultural activities?	100.0	0	100.0	0	100.0	0	100.0	0
4	Do you pack and sell your vegetables?	0	100.0	0	100.0	0	100.0	0	100.0
4	Do not attempt to dry out and sell your vegetables?	0	100.0	0	100.0	0	100.0	0	100.0
4	Is there a vegetable factory?	0	100.0	0	100.0	0	100.0	0	100.0
4	Do you attempt to sell your vegetables directly?	0	100.0	0	100.0	0	100.0	0	100.0

CONCLUSION

Twelve indicators in entrepreneurship and 42 indicators in rural sustainable development were examined to determine the effects of agriculture on indices of entrepreneurship and rural sustainable development in the villages studied. According to the results of analyzing the questionnaire findings with correlation coefficient test to analyze the effects of agriculture on indices of entrepreneurship and rural sustainable development in the villages studied, the total mean of quality of entrepreneurship in villages is Janadleh, 3.90; Chamim, 3.83; Oudeh 3.80; and Albuid 3.40.

Moreover, total average of indices of sustainable rural development in the village Janadleh is 4.57, Chamimis 3.66, Oudehis 3.64, and Albuidis 3.57. Therefore, within the theoretical approach of the study, there is a significant relationship between vegetable cultivation and entrepreneurship of villagers. Moreover, there is a significant relationship between the cultivation of vegetable with indicators of rural sustainable development.

The results of this research were consistent with the findings of [2], [7],[8], [16], [10], [11], [12], [18], [19], [20].

CONFLICT OF INTEREST

Authors declare no conflict of interest.

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REFERENCES

- [1] Studiorum MA. [2008] Agriculture and Rural Development policies Analysis in the wester Balkan countries, Bologna Italy.
- [2] Verheul I, Wennekers S, Audretsch D, Thurik R. [2001] An eclectic theory of entrepreneurship: Policies, Institutions and Culture, Determinants and policy in a European- US Comparison. 27:11-81.
- [3] Javan J, Alavizadeh SAM, Kermani M. [2011] diversification of economic activities in Sustainable Rural Development Case Study: Semirom city, Geography, new era, the ninth year. 29:43-17.
- [4] Fathi S, Motlagh M. [2010] the theoretical approach based on sustainable rural development information and communication technology (ICT), Human Geography Quarterly. 2:47-66.
- [5] Shajaat AM. [2007] Population Pressure, agricultural intensification and changes in rural systems in Bangladesh, Geoforum. 38(4):720-738.
- [6] Badri SA, Rukn al-Din Eftekhari, Salmani M, Bahman DA. [2011] the role of family farming systems in operation in Sustainable Rural Development (Case Study: bitumen and Karzin city of Fars province), Research in Human Geography. 76:48-33.
- [7] Qadermazi H. [2015] strategic planning, development of employment in rural areas of the city peers, Quarterly Journal of Economics space and Rural Development. 1:130-109.
- [8] Colagar P, Aghayi M. [2014] The Role of Agricultural Entrepreneurship in Rural Development, Journal of Entrepreneurship in Agriculture. 1(1):83-61.
- [9] Azizi H, Aslani B, Gemini D, Taghdisi A. [2013] an analysis of the effects of agricultural processing industries in rural development case study, Seyedan city near Shiraz, applied research Geographical Sciences (Geographical Sciences). 13(28):136-152.
- [10] Daman Bagh J. [2011] the role of agriculture in rural development (Chaghanarges district, Kermanshah), agricultural engineering master's thesis trend Rural Development, University of Al-Khwarizmi, Tehran.
- [11] MonazamEsmail Pour A, Kordavani P. [2010] the role of agriculture with emphasis on rural development saffron in

- the city of Kashmar, Top Rural province, Land Geographical Journal. 7(26):51-31.
- [12] Mahdavian F. [2010] The Role of Agriculture in Rural Development, National Scientific Conference of students of geography, Tehran, Tehran University.
 - [13] Liebersen J, Gisselquist D, sheikh SA, Kamal MR. [2005] An Evaluation of the Bangladesh Agro-Based Industrial and Technology Development Project, (ATDD II) submitted to united states Agency for International Development / Bangladesh, submitted by development Associates, Inc. 1730N. Arlington, VA22209.
 - [14] Dabbert S, Haring AM, Zanolli R. [2004] Organic farming: policies and prospects. London: Zed Books.
 - [15] Seipel MD. [2004] The role of agriculture in rural development in Ghana. File://A:\Ghana Michael %20 seinel htm.
 - [16] Bantel K, Jackson S. [2000] Top management and innovations in banking: does the composition of the top team maked difference. Strategic management journal. 7: 107-110.
 - [17] Graham B. [1998] Sustainable agriculture and rural development. IICA Quarterly Newsletter Journal. 4(1):1-2, 8-9.
 - [18] Parikh A. [1996] Impact Of Rural Industrialization On Village Life: A Social Accounting Matrix Approach, Economic Development And Cultural Change. 44(2):351-377.
 - [19] Zahedi MJ. [2013] development and inequality, Eighth Edition, Tehran: Maziar Publishing. 1-368.
 - [20] Wayne AE. [2004] Millennium challenge Croperation- The role of agriculture... File://A:\ Millennium %20 challenge.

ARTICLE

EFFECTIVENESS OF EDUCATION ENRICHMENT MARITAL RELATIONS BASED ON THE MODEL OLSON IN QUALITY OF LIFE

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ABSTRACT

The research aimed to investigate effectiveness of Education enrichment marital relations based on the model Olson in Quality of life was performed. Therefore, the research employed a semi-experimental method with pre-test, post-test and control group design. The research sample included 32 couples who were randomly assigned into experimental group of couples' Olson model (16 couples) and control group (16 couples). The independent variables of marital enrichment model of Olson (8 sessions) were conducted on the experimental group while the control group didn't receive any training. The research tool was Quality of life questionnaire and the research hypothesis proposed That of Education enrichment marital relations based on model the Olson in Quality of life is effective. The results which were analyzed using covariance analysis indicated that couples' communication model exerted significant effects on in Quality of life at the level ($P < 0/000$) has.

INTRODUCTION

KEY WORDS
marital enrichment
model, the Olson,
Quality of life.

Family, social institution in human history is the most important and exalted field of developmental, emotional and social growth and development of their members has provided The most sensitive The most sensitivemarriage of emotional commitment that people have a mental tranquility and warm and sincere relationship Accepts it. Marriage is one of the most important decisions Many people find the time and energy to create the marital relationship voluntarily. couples spending more time preparing feast their marriage over the acquisition of skills and to have a happy marriage and do not spend much time durable to research The results show that that family issues and problems is increasing day by day in our country and the quality of life and satisfaction of marital relationships is decrease in own again. Increases in divorce and familial Conflict threatens not only on families, but also serious threat to the society and social systems. Education of healthy generation and future of society mental disorder that can carry on, in an environment of peace and security is low, is not possible. couples severe and pervasive the problems in our country during the establishing a relationship and maintain it experience. In fact, the problem of marital helplessness more than any other category to receive the visit of Mental Health Services and Consultancy and dehumidified [1]. Development of these complications shows a lack of skills and poor satisfaction of marital relationships marital and thus reduce the quality of life of married couples. The relationship Desirable and sedative couple's not only the most appropriate field of growth and flourishing personality them provide, but also this relationship of essential needs children is and relationship a pleasant with growth and personality of appropriate of the children is very effective [2]. The term quality of life was introduced as a methodology for evaluating the clinical trials and includes all the functions of life, such as emotional functioning (anxiety and depression), physical functioning, chemical pain, fatigue. The term quality of life is the range of variation in people's lives based on body measurements of different units [3]. Quality of life is actually a phrase that is difficult to define. Overall, quality of life has different meanings and definitions for different people in different situations, but basically, it refers to individuals' satisfaction with their lives [4]. The importance of the quality of life is to the extent that some people consider some improvement in the quality of life as the primary goal of treatment [5].

Sometimes the quality of life of persons defined as life satisfaction and personal satisfaction of all issues range from your own life. Marital quality and the marital quality and marital covers. High quality level indicates the presence of the objective relationship between the spouses escorting, good communication and a lack of conflicts and satisfaction of the relationship and also encompasses wife. One of the emotional needs of couples, relations combined with the intimacy is an important source of happiness, a sense of meaning and quality of life [6].

Another effective way in enhancing the couples' marital relationship is enrichment of the relationship. Enrichment is taking a step toward the growth of marital relationship that strengthens the relationship through setting goals for marriage [7]. Marital relationship enrichment is a range of skills that are taught to gratify family's basic needs such as love, kindness, belonging, trust, commitment, security and enjoyment. Evidently, it is also the ability to control negative relationship, aggression control and the ability to help the spouse to alter his/her relational models [8]. The research purpose is to assist couples to skillfully adopt the attitude of "I-value-myself-and-I-value-you" and express their opinion on the daily problems which involve the skills of listening and having a dialogue as a part of attentive attitude. Marriage enrichment by Olson, was at the University of Minnesota (1996). The program includes the areas of marital relationship, marriage expectation, personality characteristics, Communication, conflict resolution, financial management, activities, fun and sexy, friendly social behavior, Sex, parental roles children, family and friends, relations based on role, assessing and spiritual beliefs and for those who married and demanded enrichment programs or Consultations, is designed [7].

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Existence this damage makes clear the importance of education and prevention. The absence a regular routine and efficient model for teaching couples in our community is evident. But further training to transmit the knowledge and the attitude and behavior intervention is less. Therefore, research is needed to change attitudes and behavior of couples.

MATERIALS AND METHODS

This research is applied in terms of goal and used semi-experimental method with pre-test, post-test and control group design. The independent variables including marital relationship enhancement skills training. Dependent variables included marital quality. The pre-test experimental and control groups at T1, T2 test questions, respond.

The population and sampling

The statistical population included all the Women of Isfahan city was in 2015 And since the was not possible or difficult get access to all women; Women who referred choose to have counseling centers and Since access to was not possible to all women referred to the counseling centers3 center select research sample of all women referred to these three centers were selected. The total sample size consisted 32 women in the experimental group and 16 references 16 references in the control group. Research sample randomly and randomly them to independent groups and the control group was conducted. Eligible for the groups with minimum 2 and maximum 20 years of marriage, at least read the writing, not. Exit conditions Members of the research include the absence of a meeting of the top two separated couples living together and not having been read or write.

Instrumentation

The research tool included the 100-item World Health Organization Quality of Life Questionnaire (WHOQOL-BREF). This questionnaire categorizes the quality of life in four realms including the aspects of physical health, the psychological health, social relationship and life environment. This 26-item questionnaire investigates the quality of life in general and the health status in specific. The other 24 items assess the quality of life in four realms. The short form of quality of life was normalized in Iran in 3 huge, average and small cities (Isfahan, Arak and Najaf Abad) and the Cronbach's alpha was reported to be between 0.76 and0 .82 [9].

RESULTS

After the sample selection and randomly assigned into two groups: experimental and control Quality of Life Questionnaire was administered couples The experimental group was then administered as enrichment meetings and after the meetings enrichment the quality of life questionnaire conducted in both control and experimental groups The number of sessions 8 sessions which was Elson approach these meetings two times a week for 90 minutes which is specified in the following table ended. Marriage enrichment sessions with the approach described briefly skills OlsonFirst session: administration of pre-test, establishment of the relationship and introducing the principles, regulations and objectives of the sessions. Second session: teaching the awareness cycle to couples and expressing its importance in relational issues. Third session: teaching dialogue skills to couples. Fourth session: devoting attention to spouse using listening skills training. Fifth session: planning for solving the problems. Sixth session: anger management and responding to the spouse's anger. Seventh session: selecting the communication styles and the stages of the relationship. Eighth session: exchanging, generalizing and maintaining the skills subsequent to the post-test.

Results and findings

The mean and standard deviation of pre-test and post-test scores in the Two experimental and one control groups have been presented. For testing the significance of the means' difference, covariance analysis was used. The results of Levine's test for testing the required pre-assumptions of covariance analysis have also been demonstrated.

Table 1: Mean and standard deviation of the subjects' scores in Quality of life questionnaire and in the pre-test andpost-test

stages	Groups	number	Pre-test		Post-test	
			mean	Standard deviation	mean	Standard deviation

Quality of life	Control	32	63.69	4.78	67.62	4.064
	Marital communication enrichment model	32	64.25	4.18	74.12	4.500

[Table 1] shows mean and standard deviation quality of life variable in pre and posttest on two groups control and experiment. Subsequent to the pre-test and post-test, the mean differences of pre-test and post-test scores were assessed. The mean and standard deviation of pre-test and post-test scores have been presented in the experimental and control groups.

Table 2: The results of Levine's test based on the assumption of variance equality in both groups

variables	F coefficient	Df1	Df2	Level of sig.
Quality of life	.51	1	30	.47

The test results Levine in [Table 2] indicate that the defaults respect has been ANCOVA in quality of life variable.

Table 3: Effectiveness of Training Enrichment Marital Relationship Analysis of covariance in the control and experimental group test results

Source of change	SS	Df	MS	F	sig	Effect size	The statistical power
Pretest the Quality of life	201.567	1	201.567	16.704	0.000	0.365	0.977
group	303.847	1	303.847	25.181	0.000	0.465	0.998
Error	349.933	29	12.067				
Total	161634.000	32					

According to the results of [Table 3] experimental group average than the control group has increased, also independent variable impact has a significant difference on Quality of life ($p \leq 0/000$).

CONCLUSION

Results of the study confirmed this hypothesis The results of which were cited in the fourth chapter that was shown that independent variable (marital relationship enhancement) has a significant positive effect on women's quality of life. Family, social institution in human history is the most important and exalted field of developmental, emotional and Marriage is the most sensitive and emotional commitment that people have a mental calm and warm and sincere relationship it accepts. To research results showed that family issues and problems in our country is increasing day by day and drop in marital satisfaction is own again [1]. Marital enrichment skills collection is to satisfy the basic needs of families such as love, compassion, belonging, trust, loyalty, security and pleasure, taught flora. Marriage enrichment is an educational approach, aimed at helping to improve relations between couples and couples to know himself and his wife, exploring the feelings and thoughts of his wife, developing empathy, intimacy and developing an effective relationship and problem-solving skills. [10]. Enrichment is carried in the manner and different styles, each of which will have different effects. In this study, Olson enrichment approach (preparation / enrichment) is used. The hypothesis that education, life enrichment couples Olson approach, increase the quality of life for women in couples in Isfahan. In this regard, it is specified that those principles are be used couple's relationship enhancement of quality of life and life satisfaction are more suitable. Quality of life, understanding of people of their life position with regard to culture, the values, goals, expectations, standards and concerns of the individual This a wide concept of health, psychological state, level of independence, social relationships, personal beliefs and one's relationship

with the environment covers First, the quality of life, a methodology for evaluation of treatment in clinical trials was introduced The performance includes all the functions of life such as emotional (anxiety and depression), physical performance, chemical pain, fatigue and etc. Of course the quality of life in general, variability in life range is based on measurements of the body. Especially the quality of life and mental health to communicate with the people's feelings and to express satisfaction modes of multiple functions influences people's lives [3]. Sometimes the quality of life is defined as life satisfaction people and includes a range of personal satisfaction of all its living things [6]. Kazemi, et al [11] A study of the effectiveness of programs to improve the quality of life of couples showed that the training program has a significant positive influence on increasing marital satisfaction and mental health. Mardani and shahraki [12] found that many areas of quality of life were correlated with mental health. That according to the information according to the effects of enriching marriage on the provision of basic needs such as family, love, compassion, belonging, trust, loyalty, security and joy leaves as well as family and introducing Map of intimacy and flexibility, discuss family finances, a panel discussion about the purpose and meaning of marriage, predictable results achieved in the second hypothesis is the explanation.

Also notable are the following in order to align with current research studies; The results Shah siyah [13], which took place on 30 couples showed The score improvement the overall quality of marital and sexual education on all its dimensions of marital satisfaction, sexual satisfaction, marital conflict and sexual intimacy is effective, but after marital commitment and marital adjustment has not been effective. Also noteworthy are the results Chubfroushzadh, the kalantari and molavi[14] showed that the effect of cognitive behavioral stress management on quality of life and affect marital satisfaction in infertile women according to a decrease in marital satisfaction in infertile women and effectiveness of mental intervention, psychological therapies can be useful in these patients. Sanford [15] in their study of expectations and husbands during discussions of conflict controversial documents on the quality of marital life has an important role. Among expectation of being understood by his wife and positive documents play an important role in reducing conflicts. Bakvm et al [16] study also showed that women who responded to the training program improved communication, increased interaction was very high positive impulses More likely to be distracted after 5 years. Also, in order to align with the results of the research study Ghasemi et al [17], Romeo et al [18] , Lin et al [19] , Miodrag and Hodapp [20] is also notable. In explaining the results achieved can be concluded from the study according to their effects in terms of the variable marital relationship enhancement listen maker, plans to introduce family and dimensions of intimacy and flexibility, Conversation about financial issues, family, group conversation about the purpose and meaning in life's spouses; Along with couples impact on quality of life leading into increased the quality of couples' life, which is in line with the stated results obtained from the study explained.

CONFLICT OF INTEREST

There is no conflict of interest.

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None

REFERENCES

- [1] Fqhyrpour M. [2004] Social skills of marital compatibility. Rasht, Publications State Welfare Organization of Gilan province30-95..
- [2] Amini I. [2004] Marriage faith or ethics family. 19th ed. Tehran: Islamic Thought Press;. p. 86-7. [In Persian].
- [3] Meltzer-Brody S,Davidson J R [2000] Completeness of response and quality of life in mood and anxiety disorders. Depression and anxiety. 12: 95-101.
- [4] Cummins RA. [2005] The domains of life satisfaction: An attempt to order chaos. Citation classics from social indicators research, 559-584.
- [5] AhmadiF, SalarA R, Faghihzadeh S A, [2004]. Quality of life in Zahedan. Journal of Hayat. Tehran University of Medical Sciences. 22: 61-67.
- [6] Pielage S, Luteinjin F, Arrindell W. [2005] Adult attachment, intimacy and psychological distress in a clinical and community sampel. Clinical Psychology and Psychotherapy; 12:455- 464.
- [7] Berger R, Hannah MT. [1999] Pereventive approaches in couple therapy. Lillington, NC: Taylor & Francis18-27.
- [8] Bahari F, [2004] . Marital relationship skills training. Tehran: Roshd publication.
- [9] Usefy A R, Ghassemi G R, Sarrafzadegan N, Mallik S, Baghaei A M, Rabiei K[2010] . Psychometric properties of the WHOQOL-BREF in an Iranian adult sample. Community Mental Health Journal. 46(2):139-147.
- [10] Baron KG, Smith TW, Butner J, Nealey- Moorse J, Hawkins M W, Uchino BN. [2005] . Hostility, anger, and marital adjustment: concurrent and prospective associations with psychological vulnerability. Journal behave med, 30: 530-514.
- [11] Kazemi P, Agha Mohammadian Sherbaf H, Modarres Gharavi M,Mahram B, [2010] . Effectiveness of programs in enhancing the quality of life of couples in marital satisfaction and mental health. Journal of Counseling and Clinical Psychology. 1 (2): 71-86.
- [12] Mardani Hamouleh M, Shahraki Vahed A [2009] An investigation into the relationship between mental health and quality of life in cancer patients. Scientific Journal of Hamadan University of Medical Sciences and Health Services. 16(2):42-54.
- [13] Shah Siyah M [2008] . Effectiveness of sexual training in the improvement of marital relationship quality in Isfahan City. MA thesis. Isfahan University50-114.
- [14] Chubfroushzadh, kalantari molavi [2010] .. The effectiveness of of cognitive behavioral stress management on marital satisfaction in infertile women. Journal of Mental Health. 3(12):603-596.

ARTICLE

PREDICTING INPUT VOLTAGES TO ADJUST ANGLE AND VELOCITY OF ROBOT JOINTS USING NEURAL NETWORK, MULTI OBJECTIVE DECISION MAKING ANALYSIS AND FUZZY CLUSTERING

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ABSTRACT

As the initial contribution, by employing a neural network, this paper proposes a model to regulate the input voltages of the robot Robuarm based on the desired angle and angular velocity values of its joints. Robuarm is a robot with three degrees of freedom in which each joint has a motor. The proposed model demonstrates an accuracy of 99.5 percent. As the second contribution, based on the policies of focusing on energy consumption reduction, focusing on joints optimal angular velocities and focusing on the optimum angles in joints movements, a hybrid efficient method to select the optimized robot movements is proposed. The proposed method is based on using multi-objective decision-making analysis and fuzzy clustering and finally employing the proposed neural network model to find the optimal solution.

INTRODUCTION

Robot is an automatic device that can perform intelligent actions like human. Therefore, scientists are trying to build robots to meet human needs in different ways and ultimately, reach a robot with full functionality of human. In the dynamics calculation phase, angle and angular velocity of the robot joints are important factors which are set in terms of the input voltages. Therefore, it is necessary that this complex relationship be studied by using a complex model like the neural network (NN). Employing NNs in such problems started from the early 20th century in which Warren McCulloch and Walter Pitts applied the neural networks in the field of arithmetic and logic sciences.

By investigating the related literature of employing a neural network it can be found that they are employed in control of a mobile robot motion [1], control of industrial robots [2], design and implementation of the robot arms [3], moving audio visual robot [4], adaptive chaotic behavior of robots [5], development of compositional and contextual communicable congruence in robots [6], learning algorithms based on control systems of a robot [7], Stochastic adaptive optimal control of robots [8], learning to reinforce the visual control of robots [9].

In this paper, a neural network (NN) is designed to identify the relationship among the robot Robuarm parameters. Robuarm is a robot with 3 degrees of freedom in which each joint has a motor. The NN is designed to calculate the required voltages by identifying the angle and angular velocity of each joint. For the training purposes, this paper employs a hybrid method based on NNs, Multiple-criteria Decision Analysis and Fuzzy Clustering to show that how an optimum method could be selected among the available solutions.

The following subsections give a representation of the key points of the paper

Robuarm_s6.2 robot

As illustrated in [Fig. 1], this robot is a robot with 3 degrees of freedom (with 3 joints) that each joint has a motor. Dynamics of the robot includes dynamics of arm itself and engines used in joints, and its parameters are defined as follows:

- u_1, u_2, u_3 : input voltages to engines of each joint
- q_1, q_2, q_3 : Angles of each joint in radians
- q_4, q_5, q_6 : Angular velocity of each joint in radians per second

By changing the values input voltages, angular velocity and angles values are adjusted as a function of the voltages.

KEY WORDS

Robot Dynamics, Neural Network, Fuzzy Clustering, Multi Objective Decision Making Analysis.

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Fig. 1: The Robuarm_s6.2 robot.

Artificial neural networks

Artificial neural networks (ANN), or in simpler words neural networks, are powerful computational methods and systems for machine learning, knowledge representation and finally, applying the knowledge obtained to predict the output response of complex systems. The main idea of these networks is partly inspired by the functionality of biological nervous systems to process data and information for learning and knowledge creation. The key element of this idea is creation of new structures for data processing systems. The system consists of a large number of extra integrated processing elements called neurons which work together in harmony to solve a problem. Flexibility of neural networks to estimate non-linear functions caused them to be used as a useful tool in data processing operations. Neural networks can solve problems which are difficult for simulation, or their rules are not known or are incomplete.

Multi-objective decision-making analysis and clustering

Multi-objective decision-making models (MODM) are used to find the optimal solutions. These models include problems in which candidate choices were not pre-determined and the decision maker should be initially focused on the design of a choice which has the highest utility considering the limited resources. Clustering is one of the branches of non-supervised learning and it is an automatic process in which samples are divided into categories with similar members which are called clusters. Therefore, a cluster is a set of objects in which set members are similar to each other and are dissimilar with entities in other clusters. Various criteria can be considered as the similarity metric. For example, distance criterion can be used for this purpose, and objects that are closer to each other are to be considered as a single cluster. This type of clustering is also known the distance-based clustering.

Rest of the paper is organized as follows: Section 2 describes the NN model for prediction of the input voltages. It also discusses the performance evaluation of the model. The hybrid efficient method to select the optimized robot movements is proposed and discussed in section 3. Finally, section 4 concludes the paper.

PREDICTION OF THE INPUT VOLTAGES USING NN

To determine the amount of input voltages based on the angle and angular velocity of joints, we define independent variables as angle and angular velocity of joints and dependent variables as input voltages. Therefore, we define six independent variables that have an influence on the three dependent variables. To find a relation between dependent variables and the independent ones there is a need for training data for various input voltages, angles, and angular velocities of the respective joints. Therefore, data obtained from the evaluation of 2397 experimental data was collected and saved in the data matrix. Then the neural network, its inputs ($q_1, q_2, q_3, q_4, q_5, q_6$) and its outputs (u_1, u_2, u_3) were defined in the MATLAB software based on the following piece of code:

```
transpose=data';
input=transpose(1:6,:);
output=transpose(7:9,:);
net = newff(input, output, [10 10], [], 'traingdm', 'learnsgdm');
net.trainparam.epochs = 1000;
net.trainparam.lr = 0.05;
net.trainparam.mc = 0.9;
net = train(net,input,output);
actual = sim(net,test);
```

[Fig. 2] shows the performance of the model. It can be seen that after its training, the model error is just 0.5 percent which is an acceptable and eligible value.

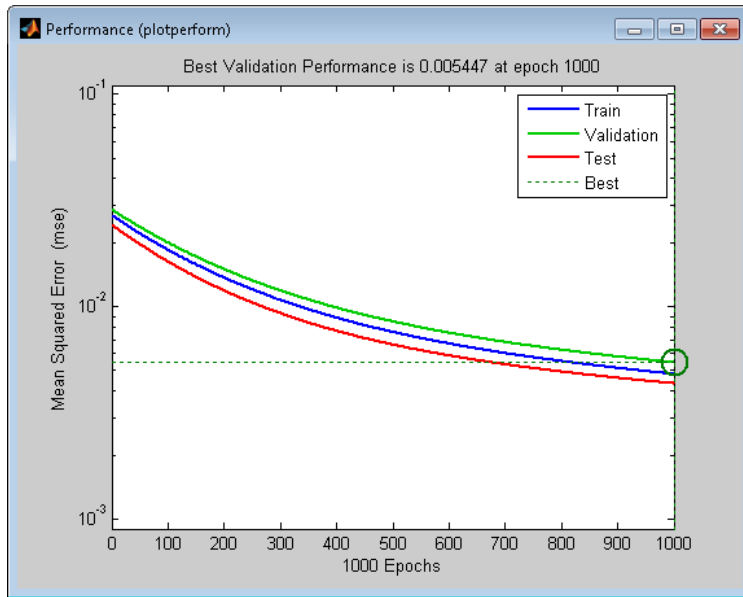


Fig. 2. The Network performance.

Performance evaluation of the network

To evaluate the performance of the NN, in the next phase, it was fed by 5 different input group values of q1,q2,q3,q4,q5,q6 and the output was compared with the empirical expected values. The data of this experiment is shown in [Table 1].

Table 1: Results of evaluating the network performance

Input Data						empirical expected values			Network output		
q1	q2	q3	q4	q5	q6	u1	u2	u3	u1	u2	u3
2.094	1.920	1.484	0.186	-0.208	0.471	2.212	17.700	11.261	2.212	17.695	11.250
2.094	1.920	1.484	0.153	-0.213	0.551	1.944	17.668	9.094	1.943	17.653	9.085
2.094	1.920	1.484	0.150	-0.216	0.631	3.058	18.811	8.636	3.058	18.802	8.630
2.094	1.920	1.484	0.170	-0.220	0.708	5.086	20.412	9.350	5.085	20.407	9.342
2.094	1.920	1.484	0.186	-0.224	0.778	6.469	21.506	9.570	6.464	21.487	9.568

As it can be seen the input voltages of the robot and the output of the NN have a low difference which approves the performance of the NN. Therefore, this NN can be employed in tuning the input voltages of the robot.

APPLICATION OF THE MULTI-OBJECTIVE DECISION MAKING AND FUZZY CLUSTERING TO SELECT THE OPTIMAL MOVEMENT SCENARIO

We define 3 requirements that we prefer to meet them for a better performance of robots. These requirements can be defined based on the following policies:

- 1- First policy, entitled "approach with focusing on reducing energy" pays more attention to the issue of reducing input voltages.
- 2- Second policy, entitled "approach with focusing on optimal speed of joints movement" pays more attention to movement velocity of the joints.
- 3- Third policy, entitled "approach with focusing on optimum angle in joint movement" pays more attention to the issue of movement angle of joints.

To select the optimal movement scenario which meets most of our requirements, an innovative method is proposed which is more fully described in the following. In this method, a combination of multi-objective decision making analysis and fuzzy clustering is provided and eventually, an NN, to select the best scenario, is applied. The purpose of multi-objective decision-making model is to optimize the overall utility function for the decision maker.

Considering all the applicable movement scenarios in Robuarm, one should be chosen to have the most effectiveness on the performance of the robot. To accomplish this, at first, different scenarios should be applied to the model and their results on the robot be observed. Therefore, 100000 random data, each

consisting of six angles and angular velocity of joints ($q_1, q_2, q_3, q_4, q_5, q_6$) are given to robot to sort their effectiveness value by employing them. In the next step, the input voltages can be chosen by one of the forecasting methods via using those sorted effectiveness values. Through considering the following restrictions, the best policy can be selected:

- The input voltages should not be more than the amount of defined voltages.
- Velocity of joint movements should be defined in the movement velocity range.
- Angle of joint movements should be within the defined movement angles.

To create 100000 data points, it is initially necessary that the range of values $q_1, q_2, q_3, q_4, q_5, q_6$ be determined. Therefore, we design the optimization matrix. Ideal solutions are obtained for each q_j^* ¹ by solving following problems (we run the model every time for optimizing each q_j).

$$\begin{aligned} \max : q_j \quad j = 1, 2, \dots, k \\ \text{limitations : } ax \leq b \\ x \geq 0 \end{aligned} \quad (1)$$

To optimize the above model, we form the following matrix in such a way that it optimizes each j -th row. Any q_{ij} represents the value of i -th objective, when the j -th objective comes to its ideal (q_j^*).

Table 2: The optimization matrix

	q_1	q_2	q_3	q_4	q_5	q_6
q_1	q_{11}^*	q_{12}	q_{13}	q_{14}	q_{15}	q_{16}
q_2	q_{21}	q_{22}^*	q_{23}	q_{24}	q_{25}	q_{26}
q_3	q_{31}	q_{32}	q_{33}^*	q_{34}	q_{35}	q_{36}
q_4	q_{41}	q_{42}	q_{43}	q_{44}^*	q_{45}	q_{46}
q_5	q_{51}	q_{52}	q_{53}	q_{54}	q_{55}^*	q_{56}^*
q_6	q_{61}	q_{62}	q_{63}	q_{64}	q_{65}^*	q_{66}^*

The considered ranges are shown in [Table 3].

Table 3: The range of the q_i values

	q_1	q_2	q_3	q_4	q_5	q_6
min	2.094	1.920	1.484	0.245	0.239	0.779
max	2.006	1.571	1.484	0.225	0.237	0.710

An important issue raised is that sorting the 100000 data points based on their value for the decision maker is very difficult, because it should perform $n*(n-1)/2=4999950000$ comparisons for sorting data. To solve this problem, we will make the performance of the robot simpler by employing an innovative method. Our proposed method is as follows.

At first, we divide the data into several groups using the clustering method. In this grouping, the distance measurement is used to compare any two points. An important issue raised was to determine the number of clusters which is the most important issue in clustering. Given that some points may be placed between clusters, any data point often cannot be precisely assigned to a cluster. In these cases, fuzzy clustering method is a more suitable method for displaying the crisp structure of this type of data. Many studies relating to the fuzzy clustering have been conducted, but here we use the following criterion for this purpose:

$$s(c) = \sum \sum (\mu_{ik}) m (||x_k - v_i||^2 + ||v_i - \bar{x}||^2) \quad (2)$$

n : number of data items that should be clustered

c : number of clusters ($c \geq 2$)

x_k : the k -th data point which is shown using the vector $x_k = (x_{k1}, x_{k2}, \dots, x_{km})$

\bar{x} : average of the values x_1, x_2, \dots, x_n

v_i : a vector that shows the center of the i -th cluster

$|| \cdot ||$: norm

μ_{ik} : membership degree of the k -th data item in the i -th cluster

m : an adjustable weight (generally $1.5 \leq m \leq 3$)

The optimal number of clusters c is equal to integer that value of $s(c)$ comes to its minimum value. As always, it is assumed that this minimum point is a local minimum. As seen in the above equation, the first sentence on the right is variance of the data within a cluster, and the second sentence is variance among the clusters themselves. Therefore, the optimal number of clusters is determined by minimizing variance among data within each cluster and maximizing variance among clusters themselves. The above formula

¹ q_j^* is the ideal value of q_j

will be employed for different values of c . When an extremum point on the curve of $s(c)$ is tracked, that value is selected for c .

MATLAB software was used to calculate the values of above parameters in which parameters of the equation $s(c)$ have been obtained by using equation (3).

$$[v, u, obj] = fcm(x, c)$$

(3)

Using the above equation, we obtain values of v (which are v_i in equation (2)) and also u (which are μ_{ik} in equation (2)), for different values of c . In our case study, values of $s(c)$ are achieved in accordance with [Fig. 3].

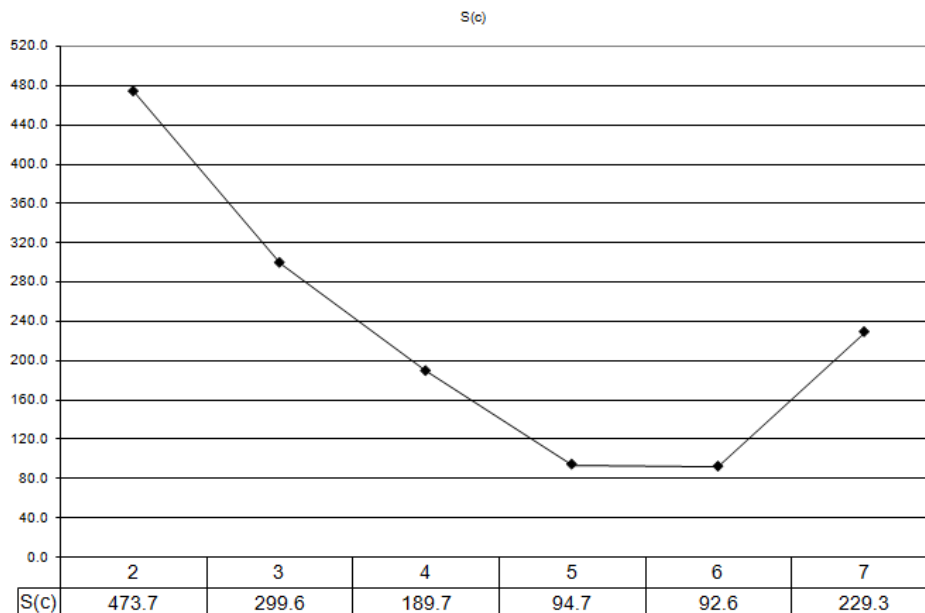


Fig. 3: $s(c)$ and number of clusters.

The above graph shows the changes of $s(c)$ in the fuzzy modeling of our case study based on the above equation. In this case, the optimal number of fuzzy clusters was 6. Therefore, we assign these 100000 data points to 6 clusters according to their highest degree of membership to those clusters.

After the placement of data points in clusters, we select the best cluster and evaluate only the data of it in order to determine the optimal data points and put the rest of data aside. To select the best cluster, we compare v_i of the categories (center of clusters) together. Here, cluster no 2 was selected as the best one. Finally, to select the best data points, it is necessary that input voltages values for the angle and angular velocity of the selected points be estimated. This can be achieved using the designed NN in section 2. Therefore, the optimum data items based on the overall gain were selected.

CONCLUSION

Robuarm is a robot with three degrees of freedom (with three joints) that each joint has a motor. For the accurate operation of Robuarm, it is necessary to select the input voltage of each joint based on its desired angle and angular velocity. Since a known relation is not found between these parameters, a neural network was designed for modeling the relation. Using the 2397 training samples, we trained it and showed that it can predict the input voltages with an accuracy of 99.5 percent.

It was shown that three policies which are focusing on energy consumption reduction, focusing on joints optimal angular velocities and focusing on the optimum angles in joints movements can be considered before implementation of a robot. As the second contribution, this paper employed a hybrid method based on neural networks, Multi-objective decision-making analysis and fuzzy clustering to optimize the utility function and showed that how an optimum method could be selected among the available solutions. To achieve this 10000 points in the parameters space of the joints were selected and we sorted them based on their efficiency value. The sorting operation was optimized using a fuzzy clustering method. Then, using the multi-objective decision-making analysis and by employing the designed NN; optimum data items based on their overall gain were selected.

CONFLICT OF INTEREST

Authors declare no conflict of interest.

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REFERENCES

- [1] Jasmin velagic, nedim osmic, bakir lacevic, [2008]neural network controller for mobile robot motion control", world academy of science, engineering and technology 47.
- [2] Vesna rankovi, ilija nikoli.[2005] control of industrial robot using neural network compensator", theoret. appl. mech., 32(2): 147.163, belgrade.
- [3] Thuong d le, gary I dempsey,[2002] using a neural network model for a robot arm to design and implement conventional and radial-basis function neural controllers" , senior project proposal, bradley university december 9,.
- [4] Alexander bekiarski, audio visual system with cascade-correlation neural network for moving audio visual robot" proceedings of the 10th wseas international conference on neural networks.
- [5] JM Valenzuelaa CT Torres. [2016] Adaptive chaotification of robot manipulators via neural networks with experimental evaluations", Neuro computing, 182: 56–65.
- [6] Park G, Tani J,[2015] Development of compositional and contextual communicable congruence in robots by using dynamic neural network models", Neural Networks, 72:–122.
- [7] Park G, J Tani G. [2015]"Control of a direct drive robot using fuzzy spiking neural networks with variable structure systems-based learning algorithm", Neurocomputing, 149, (Part B): 690–699.
- [8] Li J, Guo X, Li Z , W Chen, [2014]Stochastic adaptive optimal control of under-actuated robots using neural networks", Neurocomputing, 142:190–200.
- [9] Miljkovića Z, Mitića M, Lazarevićb M, Babić B. [2013]Neural network Reinforcement Learning for visual control of robot manipulators", Expert Systems with Applications, 40(5): 1721–1736.

ARTICLE

THE SURVEY OF THE RELATIONSHIP BETWEEN THE ORGANIZATIONAL ETHICS AND HUMAN RESOURCE PRODUCTIVITY AMONG HORMOZGAN UNIVERSITY STAFF MEMBERS

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ABSTRACT

Organizational ethics includes the regulations, standards and the principles which set forth the instructions and the guidelines required for proper ethical behaviors and conscientiousness and truthfulness under particular organizational circumstances. The present study is an applied research of the descriptive-correlation type aims at the survey of the relationship between the organizational ethics and the human resources productivity among the staff members working in Hormozgan University. The study participants include 196 individuals of the Hormozgan University staff members selected based on a random method and they were asked to complete the organizational ethics and productivity questionnaires to gather the information required for the present study. The data were investigated by taking advantage of SPSS software and through making use of analytical regression tests and one-way variance analysis. The results indicated that organizational ethics is a statistically significant predictor of the productivity. The aspects of veneration and respect, job occupational conscientiousness and also the social courtesy dimension are all statistically significant predictors of productivity and they have been found to have a significant relationship therewith. However, there was found no significant relationship between the two variables of altruism and sportsmanship with Hormozgan University staff members' productivity. It is hoped that the present research plan can be effective and prosperous for excelling all of the organizational ethics aspects and consequently it can be followed with the enhancement in the human resources productivity.

INTRODUCTION

Ethics is defined as a system of values, beliefs, fundamental principles, dos and don'ts based on which the organization's being of a good or a bad nature can be determined and the proper deeds can be distinguished from the improper ones [1]. As put by Swenson and Wood (2004), organizational ethics include the regulations, standards and principles which provide for the instructions and guidelines required for ethically and conscientiously appropriate conducts and truthfulness, as well, under certain organizational conditions. In the discussions, the organizational ethics emerged in the west as a scientific territory in the second half of the twentieth century and it has attracted the attention of the various researchers in individual and organizational levels during the recent four decades and it has been frequently reminded of as an essential challenge in the face of the different organizations worldwide [2]. It is clear that observing the principles and methods of correctly fulfilling one's job brings about the conditions for the survival of every organization which is required to focus on and deploy productivity resulting strategies in the today's competitive world. Productivity is comprised of two terms including efficiency which means correctly accomplishing one's job and effectiveness which is interpreted as performing right things. A certain extent or threshold maybe not clearly definable for achieving productivity but what seems to be more important in this regard is reaching to the optimality point in carrying out the organizational tasks and assignments. There are many factors involved in enhancing the productivity in the organizations such as environmental factors including cultural, economical and social and occupational factors including the availability of the tools and instruments for modifying performances based on theoretical and objective standards and also job planning, individual factors such as values, beliefs and competencies, organizational factors such as staff participation, service compensation systems, accurate appointment and selection of the staff members, instructional programs, leadership styles and the organizational structure. Moreover, in order to enjoy a dynamic and developed future and in order to be able to economically withstand the highly competitive world of today, there is a need for an increase in the organizational productivity and making maximum exploitation of the minimum available facilities. Nowadays, the entire developed or developing countries have discerned the importance of productivity as one of the necessities regarding economical development and competitive superiority acquisition. Also, since the occupational ethics are considered as the most important cultural factor in economical development and because the human resources comprise the basic foundation of the nations' wealth the performances, the behaviors being of an ethical or unethical nature can cause the emergence of positive and negative outcomes in an organizational level [3]. According to what has been mentioned up to the present point, we are seeking to generally deal with the survey of the relationship between the organizational ethics and the human resources productivity and evaluate the relationship between the veneration and revere, occupational conscientiousness and dutifulness, social courtesies, altruism and sportsmanship aspects with the staff members productivity in Hormozgan University in the present study and finally we try to find answers to the questions proposed based on the same ideas.

Study hypotheses

Main Hypothesis: there is a relationship between the organizational ethics and the human resources productivity in Hormozgan University staff.

KEY WORDS

organizational ethics,
human resources
productivity

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Secondary hypotheses

1. There is a relationship between the respect and veneration aspects with Hormozgan University staff members' productivity.
2. There is a relationship between the occupational conscientiousness and dutifulness with Hormozgan University staff members' productivity.
3. There is a relationship between the social courtesies and Hormozgan University staff members' productivity.
4. There is a relationship between altruism and Hormozgan University staff members' productivity.
5. There is a relationship between sportsmanship and Hormozgan University staff members' productivity.

Study background

Organizational ethics

According to what has been asserted by Ahmadi.pur, (2009), organizational ethics is an intellectual process of discovering the decision-making related and behavioral options and then selecting the best possible choices by the entire array of the individuals involved. Nowadays, in analyzing the organizations' behaviors, dealing with the ethics and moral values is considered as a requirement. The organizations' external outlook is composed of the way they behave ethically which is per se a summative result of the variegated ethical values appeared and emerged in such organizations. Under the status quo of the affairs, non-adherence to some of the ethical standards has caused a great deal of concerns and worries in both the governmental and non-governmental sectors. The downfall of the behavioral scales in governmental sectors has made the researchers to be looking for subjective basics in this regard in order to be able to pave the way for a more appropriate executive path thereof. Thus, one of the most substantial problems to which the efficient managers have to cope with in various levels is the way the appropriate groundings should be created in order for the human factors working in all of the professions to be able to deal with the problems residing in their jobs and their immediate society with feeling perfect responsibility and commitment and comply with the ethical principles governing the issues in their occupations and professions. Organizational ethics have different aspects each of which has been found highly influential on the organizational performance consequences.

Organizational ethics aspects

Respect and veneration

Politeness and kindness are expressive of the way the individuals treat their peers, supervisors and organizational clients. The individuals who use politeness and sincerity in their way of treating the others are of a highly excellent citizenship behavior [4].

Dutifulness

Dutifulness is a voluntary behavior in line with making substantial contributions to the organization in which the employees move beyond their minimum occupational requirements needed in the fulfillment of what has been assigned to them (such as carrying out voluntary behaviors along with the main tasks, adhering to the organizational rules and regulations and non-wasting of the work time) [5].

Social courtesies

Civic virtues (social rites) include behaviors such as participation in the extra-ordinary and additional activities and that at occasions when it is not necessary at all, supporting the development and changes offered by the organizational managers and having reading tendencies for instance books, magazine and enhancing one's own general knowledge and caring for installing posters and announcements in the organizations in order to inform the others of the latest news [6]. Social rites are reflective of the behaviors which are indicative of the responsibly participation of the individual in the organizational activities and affairs and his giving value to the organization.

Altruism

According to Abasi .&Mohamadian.(2008), altruism is a voluntary behavior the main objective of which is helping the other individuals in the organization through taking organizational duties and relationships into consideration, such as voluntary helps aimed at the newcomers to the organization or less-sophisticated staff and also aiding the staff members who sometimes get too busy at work or those who are absent from work and other things of the like.

Sportsmanship

Sportsmanship or tolerability is the fourth aspect of the citizenship behavior which points to the patience in confrontation with the optimum and auspicious situations without complaining, dissidence and displeasure [7]. Sportsmanship is the tendency in the staff members for tolerating the situations in which they find less ideal conditions of interest to them without making any complaints [8].

Ergan (1988) after recounting such aspects points out that all fivefold aspect of organizational citizenship behavior might not emerge simultaneously, for instance the individuals who have been found to be enjoying a high level of dutifulness may not be always altruists and devoted or some of these aspects for example altruism and dutifulness may be used as tactics for exerting pressure on the organizational managers that is to say the employees try to influence the organizational managers' decision making trend through exercising such characteristics to gain promotion or acquire rewards. Under such states, the organizational employees turn into something more of good actors rather than being good soldiers serving the organization [9].

Productivity

Svensson Goran, Greg (2004) considers the increase in the staff management productivity among the factors in which the organizational behavior has been justified to contribute to the organizational success. Productivity is a term which refers to the maximization of taking advantage of the resources, human resources, facilities and so forth in a practical manner, reducing the production costs, expansion of the markets, enhancing employment and trying to increase the real wages and improvement in the life standards in such a way it is proved helpful to the organization (The national organization of productivity, 2000).

Human resources productivity

Maximizing the human resources deployment in a practical manner for the purpose of lowering the costs and increasing the staff members, managers and consumers' satisfaction should be taken to mean the maximum benefiting from the human resources with the objective of moving in line with the accomplishment of the organizational goals through spending the lowest amount of time and the minimum possible expenditures [10]. Nudhi introduces the factors effective on the human force productivity as "managers and employees' continuous vocational instruction, enhancing motivation among the staff members to work better and more, creation of appropriate grounds auspicious for innovation and creativity in the managers and the employees, establishment of a proper payment system based on performance, setting up a system for punishment and reward, elevating conscientiousness, corroborating the organizational sovereignty and domineering of the organizational policies in fulfilling the affairs and tasks and cost- and time-saving.

A review of the prior studies

Hunigton (2009), in his study, evaluated the relationship between the organizational culture, organizational citizenship behavior and organizational function among 146 individuals of the employees working in television program broadcasting in Uganda. The results obtained in his study indicated that there is no significant relationship between the organizational culture and the organizational citizenship behavior, but the relationship between the organizational citizenship behavior and the organizational performance was found to be statistically significant.

Fatman (2007) in his studies entitled "the survey of the relationship between the organizational atmosphere (the human principles governing the organization) and managers' productivity" through taking advantage of a statistical regression method found out that the organizational climate (the human principles governing the organization) in which decision making is a centralized process and the employees' behaviors are subject to numerous rules and procedures, productivity, job satisfaction and creativity are reduced considerably and negative attitudes heighten regarding the work groups.

Tasdighi and Ansari (2011) dealt with the survey of the organizational citizenship behavior propositions in the employees. The results obtained there in indicated that all of the organizational citizenship behavior aspects except altruism were in an intermediate level in the staff members. The sportsmanship rate differed considerably among the employees according to the type of the tasks and duties. Also, a direct relationship was found between the citizenship behavior components except sportsmanship.

Ahmadi.pur, M.(2009)in a study investigated the quality of the occupational life effect as an intra-organizational factor on the employees' productivity and the results of the study signified the presence of a direct and significant relationship between the quality of the occupational life and the employees' productivity and this latter relationship has been confirmed via correlation tests between the quality of vocational life indices and productivity.

MATERIALS AND METHODS

The present study is an applied research in terms of its objective and it is enumerated among the descriptive-correlation studies from the perspective of the nature of the data collection methods. It is noteworthy that the independent variable is "organizational ethics" and the dependent variable is "human resources productivity".

Study population, specimen and sampling method

The current study population includes 400 individuals of Hormozgan University employees. To specify the study sample volume we have made use of Morgan's table and a total sum of 196 questionnaires was administered to the study sample volume. The current study takes advantage of a randomized sampling method appropriate to the study sample volume.

Information collection method

Among the most common methods of levying the information required for the current study which is a descriptive research based on field study branch is questionnaire.

Study instrument

The present study instrument has been the organizational ethics questionnaire [11] and productivity questionnaire.

Organizational ethics questionnaire contained 3 demographical questions (job status, service historical records and education level) and there were also 19 other questions pertaining to the independent variable (organizational ethics) in which each of the factors included three questions which have been scored based on Likert's scale. To ensure the questionnaire's validity after the questionnaire was compiled, there was taken advantage of the attitudes and guidance acquired from a group of ten professors and experts in the science of management and sports management science and finally the questionnaire validity was confirmed by the group. The questionnaire reliability was also obtained by making use of retest methods (30 questionnaires were distributed by the researcher) and it was found to be 0.723 by taking advantage of Cronbach's alpha method.

Human workforce productivity questionnaire has been offered by Hersey and Goldsmith based on Achio's model in 1980. The questionnaire contains 26 questions and it is scored based on Likert's scale which deals with the survey of the 7 aspects of productivity including ability, comprehension and recognition, organizational support, motivation, feedback, prestige and consistency. The researcher-constructed questionnaire's reliability and validity have been confirmed by Taheri (2011) based on Cronbach's alpha method which has been obtained as being equal to 0.80 and it is indicative of the idea that the questionnaire enjoys a high level of confidence. In the present study the reliability has been obtained through the use of retest method and based on Cronbach's alpha method and a value equal to 0.947 was acquired.

Information analysis

In the current study, the information collected from the questionnaire was firstly codified by taking advantage of the most common instruments and statistical techniques existing in SPSS software and then the data were analyzed by making use of regression, descriptive statistics, mean, variance, standard deviation, inferential statistics in which there was made use of Pierson correlation tests and regression analysis tests.

RESULTS

Descriptive statistics

The study participants were 196 individuals from Hormozgan University employees. The questionnaires were evaluated after summing the scores based on regression and correlation tests. Based on the present study findings regarding the descriptive statistics, 100 individuals (51%) were female and 96 individuals (49%) were male and the study participants age was reported with the highest frequency rate belonging to the age ranging from 30 to 40 with for 81 individuals (41.3%) and the lowest frequency rate went to the age above 50 years of age with 27 individuals (13.8%). 74 individuals (37.8%) of the study respondents had MA degrees and 3 individuals (1.5%) had PhD degrees.

In the following section it has been dealt with the reminding of the point that the independent variable is required to follow a normal distribution in order to carry out the regression tests. The two prerequisite conditions needed in accepting the normality of the variable are skew ness and kurtosis which are needed to be in a range from 2 to -2 in order for the data to approach normal distribution. The results of the normality tests in the present study for the entire array of the independent variables showcase that the skew ness and kurtosis coefficients have been found to be in a range from 2 to -2 and it can be stated that the data follow a near normal distribution and the implementation of the regression analysis process will not come up with high error values.

Inferential statistics

In this section of the study we deal with the survey if the study hypotheses by taking advantage of the data extracted from the aforementioned questionnaires.

Hypothesis 1: there is a relationship between the organizational ethics and the productivity in Hormozgan University employees

Table 4.2.1: The summary of the regression analysis results pertaining to the relationship between the organizational ethics and productivity

Coefficient R	Determination coefficient (R ²)	Adjusted regression	Standard error	DW
0.161a	0.026	0.021	22.524	1.303

The above [Table 4.2.1] is indicative of the regression correlation coefficient of $r=0.161$ and the determination coefficient of $R^2=0.026$ between the two variables of organizational ethics, as the predictor variable, and productivity, as the dependent variable, and it turns out that the predictor variable has been able to account for 2.6% of the dependent variable variations, that is productivity.

Table 4.2.2: One-way variance analysis and the regression analysis results pertaining to the relationship between the organizational ethics and productivity

Variation source	Sum of squares	Degree of freedom	Mean squares	F	Significance level
Regression	2624.825	1	2624.825	5.174	0.024
Residues	98425.599	194	507.384		
Total	101050.42	195			

The above [Table 4.2.2] is demonstrative of the results of the one-way variance analysis and it has been found to be statistically significant in $P<0.01$ level with $F=5.174$ and $\alpha=0.001$. Thus the obtained relation is suggestive of the nest possible linear composition between the organizational ethics and productivity.

Table 4.2.3: β Coefficient and t-value and the significance level regarding the organizational ethics and productivity

Source	Non-standardized coefficient		Standardized coefficient	t	Significance level
	Regression coefficient (β)	Standard error	B		
Fixed	47.333	18.700		2.531	0.012
Organizational ethics	0.707	0.311	0.161	2.275	0.024

As it is observed in the above [Table 4.2.3], the organizational ethics significantly predicts productivity in such a manner that it has been found to be a positive predictor of productivity in a significance level of $\alpha=0.024$ (lower than $p=0.05$) with $\beta=0.161$ and $t=2.285$. Thus, according to the presence of a relationship and that be a linear one and based on the t-value calculated herein, it can be stated that the first study hypothesis is confirmed.

Hypothesis 2: there is relationship between respect and veneration with Hormozgan University employees' productivity

Table 4.2.4: The summary of the regression analysis results pertaining to the relationship between the respect and veneration aspects with productivity

Coefficient R	Determination coefficient (R ²)	Adjusted regression	Standard error	DW
0.272	0.074	0.069	21.963	1.331

The above [Table 4.2.4] is indicative of regression correlation coefficient of $r=0.272$ and the determination coefficient of $R^2=0.074$ between the two variables of respect and veneration, as predictor variable, and productivity, as dependent variable and the results show that the predictor variable accounts for 7.4% of the productivity variations.

Table 4.2.5: One-way variance analysis and the regression analysis results pertaining to the relationship between aspects of respect and veneration with productivity

Variation source	Sum of squares	Degree of freedom	Mean squares	F	Significance level
Regression	7468.907	1	7468.907	15.483	0.001

Residues	93581.517	194	482.379		
Total	101050.42	195			

The above [Table 4.2.5] is illustrative of the one-way variance analysis results which indicate that the relationship is statistically significant in $P < 0.01$ level with $F = 15.483$ and $\alpha = 0.001$. Thus the relationship obtained is the best possible linear composition that can be acquired regarding the relationship between the aspects of respect and veneration with productivity which is assumed as the dependent variable in the present study.

Table 4.2.6: β and t coefficients and significance level pertaining to the relationship between respect and veneration with productivity

Source	Non-standardized coefficient		Standardized coefficient	t	Significance level
	Regression coefficient (β)	Standard error	B		
Fixed	48.292	10.642		4.538	0.000
Respect and veneration aspects	3.829	0.973	0.272	3.935	0.001

As it is observed in the above [Table 4.2.6] the aspects of respect and veneration statistically significantly predict the productivity. In a way that they have been found to be positive predictors of productivity in a significance level of $\alpha = 0.001$ (lower than $P = 0.01$) with $\beta = 0.272$ and $t = 3.935$. Thus, according to the presence of a relation and that be a linear one and based on the calculated Beta, it can be said that the second study hypothesis is confirmed.

Hypothesis 3: There is a relationship between the job conscientiousness and dutifulness with the productivity in Hormozgan University employees

Table 4.2.7: The summary of the regression analysis results pertaining to the aspects of job conscientiousness and dutifulness with productivity

Coefficient R	Determination coefficient (R^2)	Adjusted regression	Standard error	DW
0.216	0.047	0.042	22.282	1.310

The above [Table 4.2.7] is reflective of the regression correlation coefficient results with $r = 0.216$ and determination coefficient $R^2 = 0.047$ between the two aspects of job conscientiousness and dutifulness, as the predictor variables and productivity, as the dependent variable, and it turns out that the predictor variable can account for 4.7% of the dependent variable, that is productivity.

Table 4.2.8: One-way variance analysis and regression analysis results pertaining to the relationship between the aspects of job conscientiousness and dutifulness with productivity

Variation source	Sum of squares	Degree of freedom	Mean squares	F	Significance level
Regression	4728.566	1	4728.566	9.524	0.002
Residues	96321.857	194	496.504		
Total	101050.42	195			

Based on the above [Table 4.2.8], the results of the one-way variance analysis indicated that the relationship has been found to be statistically significant in $P < 0.01$ significance level with $F = 9.524$ and $\alpha = 0.001$, thus the relationship obtained herein is reflective of the best possible linear composition of the relationship between job conscientiousness and dutifulness with productivity.

Table 4.2.9: β , t -value and significance level pertaining to the relationship between job conscientiousness and dutifulness with productivity

Source	Non-standardized coefficient		Standardized coefficient	t	Significance level
	Regression coefficient (β)	Standard error	β		
Fixed	50.028	12.957		3.861	0.000
job conscientiousness and dutifulness	2.926	0.948	0.216	3.086	0.002

As it is clear from the above [Table 4.2.9], the job conscientiousness and dutifulness aspects are significant predictors of the productivity in such a manner that they have been found to be positive predictors of productivity in $\alpha=0.002$ significance level (lower than $P=0.01$) with $\beta=0.216$ and $t=3.086$. Thus, according to the presence of a relationship and that be a linear one and based on the calculated Beta the study third hypothesis is confirmed.

Hypothesis 4: There is a relationship between the social courtesies and productivity in Hormozgan University employees

Table 4.2.10: The summary of the regression analysis results pertaining to the relationship between the social courtesies and productivity

Coefficient R	Determination coefficient (R ²)	Adjusted regression	Standard error	DW
0.152a	0.023	0.018	22.557	1.335

The above [Table 4.2.10] is indicative of the regression correlation coefficient of $r=0.152$ and determination coefficient of $R^2=0.023$ in the relationship between the social courtesies, as the predictor variable, and productivity, as the dependent variable and the immediate result coming out of the above table is that the predictor variable can account for 2.3% of the dependent variable, productivity.

Table 4.2.11: One-way variance analysis and the regression analysis results pertaining to the relationship between the social courtesies and productivity

Variation source	Sum of squares	Degree of freedom	Mean squares	F	Significance level
Regression	2341.562	1	2341.562	4.602	0.033
Residues	98708.862	194	508.809		
Total	101050.42	195			

Based on the above [Table 4.2.11], the results of the one-way variance analysis indicated that the relationship residing between the two abovementioned variables is statistically significant in $P<0.05$ significance level with $F=4.602$ and $\alpha=0.033$, thus the relationship obtained is the best possible linear composition extant between the social courtesies aspects and the dependent variable, productivity.

Table 4.2.12: β and t-value and the significance level pertaining to the relationship between the social courtesies aspects and the productivity

Source	Non-standardized coefficient		Standardized coefficient	t	Significance level
	Regression coefficient (β)	Standard error	β		
Fixed	112.311	10.658		10.53	0.000
Social courtesies	-2.827	1.318	-0.152	-2.145	0.033

As it is observed in the above [Table 4.2.12], the social courtesies aspect is a significant predictor of the productivity in such a manner that it has been found to be a negative predictor of productivity in a significance level of $\alpha=0.033$ (lower than $P=0.05$) with $\beta=-0.152$ and $t=-2.145$, thus according to the existence of a relationship and that be a linear one and the Beta obtained here, it can be stated that the study fourth hypothesis is confirmed.

Hypothesis 5: There is a relationship between the altruism and productivity in Hormozgan University employees

Table 4.2.13: The summary of the regression analysis results pertaining to the relationship between altruism and productivity

Coefficient R	Determination coefficient (R ²)	Adjusted regression	Standard error	DW
0.045	0.002	-0.003	22.799	1.319

The above [Table 4.2.13] is indicative of the regression correlation coefficients of $r=0.045$ and the determination coefficient of $R^2=0.002$ for the relationship present between altruism as the predictor

variable and productivity as the dependent variable and the main result of such analyses is suggestive that the predictor variable can account for 0.02% of the dependent variable, productivity, variations.

Table 4.2.14: One-way variance analysis and regression analysis results pertaining to the relationship between altruism and productivity

Variation source	Sum of squares	Degree of freedom	Mean squares	F	Significance level
Regression	207.439	1	207.439	0.399	0.528
Residues	100842.98	194	519.809		
Total	101050.42	195			

Regarding the one-way variance analysis results, the above table shows that the relationship is not statistically significant in $P < 0.05$ significance level with $F = 0.399$ and $\alpha = 0.528$ and the relationship obtained herein is not a linear combination between the altruism aspect and dependent variable, productivity.

Table 4.2.15: β , t-value and the significance level pertaining to the relationship between altruism and productivity

Source	Non-standardized coefficient		Standardized coefficient	t	Significance level
	Regression coefficient (β)	Standard error	β		
Fixed	80.728	14.310		5.641	0.000
Altruism	0.486	0.770	0.045	0.632	0.528

As it is observed in the above [Table 4.2.15], altruism aspects are in an insignificant relationship with productivity in such a manner that the relationship has been found to be statistically insignificant in $\alpha = 0.528$ significance level (higher than $P = 0.05$) with $\beta = 0.045$ and $t = 5.641$ and it cannot be considered as a productivity predictor and thus the fifth hypothesis is rejected, accordingly.

Hypothesis 6: There is a relationship between sportsmanship and productivity in Hormozgan University employees

Table 4.2.16: The summary of the regression analysis results pertaining to sportsmanship and productivity

Coefficient R	Determination coefficient (R^2)	Adjusted regression	Standard error	DW
0.005	0.000	-0.005	22.822	1.323

The above [Table 4.2.16] is indicative of the regression correlation coefficient of $r = 0.005$ and the determination coefficient of $R^2 = 0.000$ between the two variables of sportsmanship as the predictor variable and productivity as the dependent variable. And the immediate result obtained there in is suggestive of the idea that the predictor variable has been able to account for 0.0% of the dependent variable, productivity, variations.

Table 4.2.17: One-way variance analysis and regression analysis results pertaining to the relationship between sportsmanship and productivity

Variation source	Sum of squares	Degree of freedom	Mean squares	F	Significance level
Regression	2.477	1	2.477	0.005	0.945
Residues	101047.94	194	520.866		
Total	101050.42	195			

The results of the one-way variance analysis in the above table indicated that the relationship between the two above mentioned variables is not statistically significant in $P < 0.05$ significance level with $F = 0.005$ and $\alpha = 0.945$, thus the relationship obtained herein is not a linear combination between the sportsmanship and dependent variable, productivity.

Table 4.2.18: β , t coefficients and significance level pertaining to the relationship between sportsmanship and productivity

Source	Non-standardized coefficient	Standardized coefficient	t	Significance level
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	Regression coefficient (β)	Standard error	β		
Fixed	89.224	7.215		12.36	0.000
Sportsmanship	0.038	0.545	0.005	0.069	0.945

As it is observed in the above [Table 4.2.18], sportsmanship has been found to be in a statistically insignificant relationship with productivity in such a manner that it has been found to be statistically insignificantly associated with productivity in the significance level of $\alpha=0.945$ (higher than $P=0.05$) with $\beta=0.005$ and $t=12.367$ and therefore it cannot be a predictor of the productivity and this latter hypothesis is consequently rejected.

CONCLUSION

As it was mentioned previously, the current study aims at the survey of the relationship between the organizational ethics and the human resources productivity in Hormozgan University employees. The following section deals with the elucidation of the study hypotheses.

In elaborating on the first hypothesis proposed in the current study it is noteworthy that according to the one-way variance analysis and the regression analysis results pertaining to the relationship between the organizational ethics and productivity and also based on the obtained β coefficients and t-values and the significance level related to these two variables there was found a significant relationship between the two aforementioned variables and the first hypothesis was subsequently confirmed.

It is worth mentioning that the results obtained herein are consistent with the results obtained in the studies undertaken by Chang Chen Lin (2010) and Hanigton (2009). That is because it is well established that the ethical weakness negatively influences the organizational performance. When the organizational behavior is found to be ethically weak, the performance costs rise up overtly and covertly. Such expenditures can be identified within various areas of the organization such as the low level of productivity, organizational dynamicity slowness, lack of transparency and organizational communicative disruptions.

And, as regarding the second study hypothesis, the one-way variance analysis and regression analysis results and also Beta coefficients and t-values calculated here and the significance level, as well, indicated that there is a statistically significant relationship between the respect and veneration aspects with productivity and the second hypothesis has to be consequently considered as confirmed.

The results obtained herein are corresponding to the results obtained in the researches performed by Hanigton (2009) and Buntalo et al (2009). Proper organizational ethics and morality positively and considerably influence the organization's activities and outcomes which bring about a condition for the improvement in the productivity and organizational dynamicity and communications and reduction of the risks. One reason behind such an incident is that ethics turn into something more of a logical inference which provide for information flow increase and it provides for an additional system of the eyes and antennas for receiving organizational feedbacks in order for the organization to gain a full understanding of how it has been performing and functioning at any single point in the course of time.

The results related to the third study hypothesis test by taking advantage of one-way variance analysis tests, regression analysis tests and also the results obtained from Beta coefficient and t-value calculations and the significance level, as well, are all suggestive of the presence of a significant relationship between the job conscientiousness and dutifulness with productivity and thus the third hypothesis is confirmed consequently.

The results obtained for the study third hypothesis conform to the results obtained by Wright et al (2008), because the highly ethical organizations act as barriers to the unhealthy behaviors and they act as catalysts to the excellent and sublime inferences and performances. Another reason related to the current theme of the study claims that it is only through the pure human nature and highly superior ethics that the higher levels of innovation, teamwork and unprecedented processes can be achieved which will finally result in sustainable competitive advantage.

In testing the fourth hypothesis theorized in the current study, the statistical results of the tests reported the existence of a relationship between the two variables of social courtesies and productivity and the hypothesis was therefore confirmed.

The results obtained in the current study are consistent with the results obtained in the study carried out by Fatman (2007). The adherence to the proper accomplishment principles and method of the job have been frequently highlighted as contributing factors to the organizations' survival and it is also underlined that in competitive environments the organizations are required to concentrate on and appropriately implement productivity measures.

The tests results and the aforementioned values and rates in the fifth hypothesis proposed by the present study were not reflective of the presence of a relationship between the altruism aspects and productivity and this brought about a condition for rejecting the fifth hypothesis.

The results attained in the current study regarding the fifth hypothesis test are corresponding to the results obtained by Gholipur et al (2008). The work ethics are the most important cultural factor in economical development and the human resources are the fundamental basis of the nations' wealth and also it comes as a striking point that the behaviors and performances being of an ethical or immoral nature can bring about situations in which negative or positive outcomes would emerge in an organizational level.

In the end, regarding the last study hypothesis, it has to be stated that the hypothesis was rejected based on the test results and as a result of the lack of the existence of a significant relationship between the two variables of sportsmanship and productivity.

The results obtained in the current study regarding the last study hypothesis conform to the results obtained by Abbasi and Muhammadiyan (2006). Khodadad Hosseini et al (2010) dealt with the survey of the employees' organizational citizenship behavior level. Their results indicated that the entire array of the organizational citizenship behavior aspects except the altruism were in a higher than intermediate level in the staff members. The sportsmanship level in the staff members enjoyed a significant difference depending on the type of the tasks and duties they had been assigned with. Also, there was a direct relationship between the organizational citizenship behavior components and indicators except sportsmanship component. In the today's world, a great majority of the staff members are willing to have staff which work well beyond the tasks and duties specified in their job descriptions. They are looking for staff members who move beyond what they are supposedly expected to and they are willingly tend to demonstrate and exhibit behaviors which are not part of their formal job duties.

Finally, it is hoped that the findings obtained in the current study can be effective on the enhancement of the entire aspects of the organizational behavior and consequently the human resources productivity in all of the institutions. In the meantime, the organizations can take advantage of effective strategies to affect the staff performance and organizational productivity positively, including benefiting from the solutions such as constant employees' efficiency and effectiveness valuation based on the way they perform, reviewing and thus revising the methods of behaving with and treating the personnel as the main sources of providing service in the organizations, gratifying the competent and active individuals in whatever the way deemed appropriate, providing for the conditions in which creativity and innovation would emerge and the staff members' vocational promotion plans and other things of the like which can be helpful in this regard.

CONFLICT OF INTEREST

There is no conflict of interest.

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FINANCIAL DISCLOSURE

None

REFERENCES

- [1] Sarmad Z, Bazargan A. [2007] The methodologies in behavioral knowledges of teleworking and its methods (version. 12), Tehran: Agah publication.
- [2] Cardy R, Selvarajan T. [2006] Assessing ethical behavior: the impact of outcomes on judgment bias, *Journal of managerial psychology*. 21(1):52-72.
- [3] Hosseini A. [2006] information and data, *Iran zamin newspaper*. 25897.
- [4] Bamonar N, Homayun M. [2009] Crossings advertising: from start to Islam, *Institute of Culture, Art and Communication*, (1), Tehran.
- [5] Khodadad H, Rusta A, Khalili Shijayi V. [2010] Advertising (theory and practice), *Hurufiyeh Publishers*, Tehran
- [6] Abasi A, Mohamadian M. [2006] The relationship between consumer attitudes to websites and online advertising effectiveness, *Journal of Management Sciences in Iran*. 2(7):99-119
- [7] Koh H, Boo E. [2004] Organizational ethics and employee satisfaction and commitment, *Management Decision*. 42(5):677-693.
- [8] Golchin, SH, Bakhtae A. [2004] Missing clues Advertising, *Tadbir*. 164,55-58
- [9] Liu A, Fellows R, Ng J. [2004] Surveyors Perspectives on ethics in organizational Culture, *Engineering, Construction and Architectural Management*. 11(6):438-449.
- [10] Hasangholipur T, Anushe M, Musavi M, Mohseni A. [2008] Advertising management, *Negah danesh*. (1).Tehran
- [11] Mc Donald G, Nijhof A. [1999] Beyond Codes of ethics: an integrated framework for stimulating morally responsible behavior in organizations, *leadership & organization Development Journal*. 20(3):133-243.
- [12] Mohamadian M. [2008] Advertising Management From the perspective of marketing.
- [13] Ahmadi M. [2009] Principles of influence of advertising messages, *Tadbir*. 19(191).
- [14] Svensson G, Wood G. [2004] Codes of ethics best practice in the Swedish public sector: a PUBSEC-scal, *The International Journal of public sector management*. 17(2):178-195.
- [15] Svensson G, wood G. [2003] The dynamics of business ethics: a function of time and culture – cases and models, *Management Decision*. 41(4):350-361.
- [16] Tasdighi H, Ansari M, Jahanshahloo M. [2011] Challenges and opportunities of the resources management, *journal of human resources, analytic journal, education, notices, investigation, (E-HRM) electronic human, first year, No.4, Tehran*.

ARTICLE

HIGH-RISE RESIDENTIAL COMPLEX WITH AN EMPHASIS ON BIOCLIMATIC ARCHITECTURE PATTERN IN TEHRAN DISTRICT 22

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ABSTRACT

Today, tall building in large cities, particularly Tehran is very common. High-rise buildings are the result of demands and needs of society and the advancement of technology. Population growth - demand - lack of housing - land expensiveness are among factors which have raised tall building as a necessity, but another issue that is important here is considering the bioclimatic principles. Accordingly this study examines the climate place in the design of high-rise residential complex with the aim of increasing building density in connection with climatic and environmental conditions. In this regard, many researchers have carried out an investigation. In this research the method is descriptive - analytic. The data was collected through desk and field studies - electronic and climate consultant software where using the meteorological statistics and bioclimatic tables and so on, Tehran climate and the impact of climatic variables on building were evaluated. Finally, sustainable architecture is studied and strategies for designing climate are presented. Results of the study indicate that to establish and form the building, it should be proportional to the current of sunlight and wind and also for the optimal use of the sunshine and avoid annoying forces, canopies and appropriate materials and window should be used and to reduce energy consumption, solar energy and wind in tall buildings can be enjoyed.

INTRODUCTION

KEY WORDS

residential
complex - design - biocli-
matic - District 22 - high-

The emergence of tall buildings in our country are affected by the conditions of society and the result of limitation of levels of construction, rising price of land, increasing population and demand, housing shortage, shortage of land for construction. If the construction of tall buildings is not done in accordance with scientific principles in the field of urban planning, architecture, mechanical and electrical installations, bioclimatic conditions of project, it has many adverse and irreparable effects. Therefore, considering climatic and environmental factors in the development of residential space is not a new debate. As we know, one of the foundations for the formation of Iranian architecture, is the climate. Accordingly, architecture of hot and dry - temperate humid - hot and humid regions and so on have found its identity and structure. From the beginning, man tried to create a favorable residential environment and in accordance with the thermal and climatic conditions of their living conditions. However, in a period due to misunderstanding of Modernism view, the residential texture has changed from a dense and closed form into row houses on small and equal pieces and in one form regardless of the climatic characteristics and is still ongoing and results in loss of vitality of residential space. And in later periods, the architectures still underwent changes, but today we witness the establishment of a new style called constructing-and-selling for economic reasons. Nevertheless, human nature is such that always wanted to create an architecture compatible with the climate. In the meanwhile, attention to relations between human and his living environment has become very important to him to be satisfied. So now in solving housing problems, architects should make non-breakable relationship between the building and the environment and climate.

1.1. The importance and necessity of research

- ❖ Today due to increased constructing-and-selling style and inconsistency of building with climate, principles and rules should be provided to prevent the crisis in the housing area.
- ❖ Often residential complex design is not based on people's physical and mental needs and does not provide heat comfort inside buildings. It is better to design complexes that meet people needs.
- ❖ High-rise buildings are faced with the problem of the cost of heating and cooling systems, measures should be taken to reduce the costs.
- ❖ Observing climatic design principles and architectural standards to improve the quality of residential spaces that connect the building with its surroundings.
- ❖ Considering geological features and conditions of project to make effective use of the potentials and strengthen environmental characteristics of the project site.
- ❖ Taking advantage of the facilities to strengthen the urban and natural landscapes.
- ❖ Tall building development and optimal utilization of land due to the shortage of housing and expensive land.
- ❖ Use of neighboring land use capacity and causing good communication with the outdoor.

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- ❖ Creating modernity in architecture of building and avoiding repetition of common ways of construction of housing complexes.
- ❖ Linking building and relationship of building with the topography of the land.
- ❖ Creating a sense of place and linking man and his environment.
- ❖ Use of renewable resources and reducing building energy consumption.

1.2. Research objective

Providing housing production with new patterns which are complied with climatic conditions of the project site.

Creating a residential complex that enhance residents' satisfaction of creating thermal comfort inside the building and improving the living conditions.

Creating public spaces and private and semi-private hierarchy that increase social interaction.

Creating a residential complex which is related to the environment and meets the psychological needs of residents.

Establishing a prominent residential complex for settling urban people with middle and upper income strata.

Creating a prominent residential complex in district 22 in Tehran.

Creating green space on roof and terrace to create environmental comfort and improve climatic conditions.

Increasing building density to increase the population and shortage of land for construction.

Presenting climatic design principles to reduce building energy consumption.

1.3. Research questions

1. What are the effects of climatic characteristics of district 22 of Tehran on architecture of that district?
 2. How can we consider the climatic characteristics (environmental) of District 22 of Tehran in the formation of residential complex?
 3. How can we promote resident satisfaction by using climatic potentials in shaping the residential complex?
- Answer to the above questions will be given in the findings while examining the role of climatic elements in the building and designing a house in harmony with the climate.

1.4. Hypotheses

1. It seems that the climatic characteristics of district 22 of Tehran will be effective on the architecture of the area.
2. It seems that to form the residential complex of district 22 of Tehran, environmental factors can be used.
3. It seems that due to climatic features in the design of housing complexes, residents' satisfaction can be enhanced.

The validity of the above hypotheses will be proved in examining the role of climatic factors in building and designing a house in harmony with climate.

1.5. Research literature

Climatic factors are very effective in climatic design. Several studies have been done in the world on climate adaptation. For example, in 1953 Olgi has scientifically raised the humidity and heat condition in relation to human needs and ecological design. He attempted to draw the bioclimatic table. Geoni presented the building's bioclimatic charts in the 80s. Poor Jafar and Mahmoudi Nejad have discussed the necessity of applying the principles of ecological design in cold regions [1]. Hoshyari (2006) examined the fundamental studies of climate and architecture in design of residential space in Sareyn, architecture climate and comfort of the city [2]. Jahanbakhsh (1998) has presented an article entitled assessing human climatic condition in Tabriz and thermal requirements of the building. Tavassoli in 1981 has studied the construction in Iran's arid climate and have examined necessary items in the building in relation to climate [2]. Salighe has studied modeling housing in harmony with the climate in Chah Bahar. Tavousi et al., have evaluated the climate and architecture of modernized schools of Isfahan [3]. Yang in his article (2007) entitled "environmental skyscraper design" has introduced these construction mainly as the most non-ecological construction method, and he suggested some strategies for decreasing the negative environmental impacts and improving the quality of user activities and proposed strategies in the form of three types of systems: interactional, passive and combined for high-rise buildings [4]. In addition to the harmful environmental effects, these buildings have psychologically negative effects on users; therefore, to it is of great significance to follow-up and focusing on sustainability objectives in the design of high-rise buildings and it could partially provide psychological welfare of users. The potential role of sustainable buildings in promoting the health of users by creating natural environments and thus improving the quality of interior spaces is clear [5]. Research in the field of climate adaptation in Iran focus mainly on bioclimatic zoning and earlier studies and has less focused on climatic design and we in this study tried make the debate on climatic design more applicable and be considered in research and design - climate phase and climatic potentials.

1.6. Research method

The research method has a quantitative - qualitative approach and the research method is descriptive - analytical based on field studies (slides and photos), desk study and electronic study and climate consultant software is also used for the analysis of meteorological statistics.

1.7. Studied area

District 22 of Tehran Municipality is located between the East longitude 10° 5' 51" to 40° 20' 51" and Northern latitudes 16° 35' 32" to 19° 57' 35" in the northwest of Tehran and in the downstream of Kan and Vardij River basin. The district is restricted from north with Central Alborz mountain, in the East with Kan Rivers, in south with Tehran - Karaj freeway and in the West with a range of Vardavard planted forests and is contiguous with areas 5 and 21 of Tehran Municipality. Therefore, the northern boundary of District 22 of Tehran Municipality is developed to the extreme southern slopes of Alborz to a height of 1800 meters. Alborz Mountains which attracted the city over 30 past years, surrounds the surrounding Tehran's geographical space as crescent-shaped wall and in the height of 1800 meters due to the sharp steep and mountainous bottlenecks has created a tough barrier to city physical expansion. In district 22, the highest elevation above sea level is in the straight line of northern catchment area of the Alborz heights and in the East of Kiga Village by 3840 and the lowest level is at 1220 meters altitude in Peykanshahr city exit. The area of this district is 54,000 ha including highlands which its maximum length and width approximately equal to 26 and 17 km. The distance of West is about 11 kilometers to the beginning of Karaj. Kan River path that flows from north to south after exit point is drawn in the east area of plan and receives eastern basin surface water which is connected to it through diversion channels. Vardavard River also flows along the north-south and parallel to Kan River and is extended in the northern part in the West of central region, which in downstream, forms the west of zone. The average distance of the two rivers from each other is about 10 km.

Based on the preliminary results of Census in 2006, population is approximately about 138,970 people.



Fig. 1: Location of Tehran on Iran map



Fig. 2: Location of District 22 on Tehran map

Research theoretical principles

Each building which height (vertical distance between the disposable floor level of the highest floor to the lowest level accessible to fire engines) is more than 23 meters is considered a tall building. (PBO - 1995).

2.1. Start of construction of high-rise residential buildings in Iran

Construction of high-rise residential buildings was begun after development of apartment ownership constitution. The law was passed for the first time in 1954, followed by approving Article 100 of Direct Taxes Act in 1956, construction of tall buildings was accelerated.

The content of the Article is encouraging the private sector to invest in the construction of high-rise residential buildings. The first high-rise residential buildings in Iran are Tehran Saei Park apartments which are built by the Housing Authority in 1954-1960 [6].

2.2. Necessities and building conditions

Requisites that necessitates the construction of such buildings and conditions under which the implementation of these buildings are recommended can be summarized as follows:

1. Increased demand for housing production due to population growth in large cities,

SUPPLEMENT ISSUE

2. Fixing the limitations imposed by the shortage of urban lands
3. The need to control the horizontal expansion of cities,
4. The high cost of land in densely populated areas such as downtowns,
5. Lower horizontal distances in urban travels,
6. Construction of distinctive buildings in the city,
7. Necessity of renovation and beautification of cities,
8. Creating points of emphasis in the city.
9. Creating points of emphasis in the city [6].

2.3. Climatic design

Climatic design is a way to reduce building energy overall. Designing building is the first defense line against climatic factors outside the building. In all climates, buildings that were built based on the principles of ecological design, minimize the need for mechanical cooling and heating and in turn use natural energy available around the building [7].

2.4. Sunshine

Sunshine is "an electromagnetic radiation". Solar spectrum is divided into three parts: UV - visible - Infrared. Wavelength of UV radiation is 0.28 to 0.4 micron, visible beam is 0.4 to 0.7 and the wavelength of Infrared is higher than 0.76 microns. Given that the maximum intensity of sunlight is in the visible light, but more than half of solar thermal energy is related to infrared [8]. Sunshine is one of the most important climatic elements which affects building direction, building form and performance of interior spaces.

2.5. Air temperature

The temperature shows cold and warm air and is measured with a conventional thermometer. The ordinary thermometer is called dry thermometer and the temperature measured by it is called temperature of dried air. Since ambient air temperature is one of the factors affecting thermal comfort, the architect should be familiar with changes in temperature of studied location. For the purpose, reliable sources of information such as statistics of Meteorological Organization are used [9].

2.6. Wind

Wind is the air flow moving from high pressure to low pressure centers. The more the differences of pressure between two points, the air flow rate will be higher. Wind is a climatic element which important role in designing climate must be considered. What is considered from the impact of wind in building is the effect of wind on natural ventilation of the building and its impact on the direction and form of building.

2.7. Sustainable architecture

Richard Rogers defines sustainable architecture in this way: sustainable design is seeking to meet the modern needs, without compromising the natural resource and leaving it for future generations [10]. Principles of sustainable architecture: 1. Energy conservation 2. Working with climate 3. Reduced use of new sources 4. Respect for user 5. Respect to the site and 6. Holism [10].

MATERIALS AND METHODS

Instruments used in this research is the statistical data collected from metrological station of Cheetgar including mean monthly temperature - mean monthly wind speed and mean maximum wind direction and speed. Then using it, Tehran climatic elements will be analyzed using the climate consultant and by analyzing the role of these elements in climatic design of features of houses in harmony with the climate.

Results: In this section we analyze the hypotheses using evaluation of conditions and the effect of climatic elements in District 22 of Tehran on tall building and sustainable architecture to present design criteria and solutions for climatic design.

3.1. Analysis of Tehran climatic elements

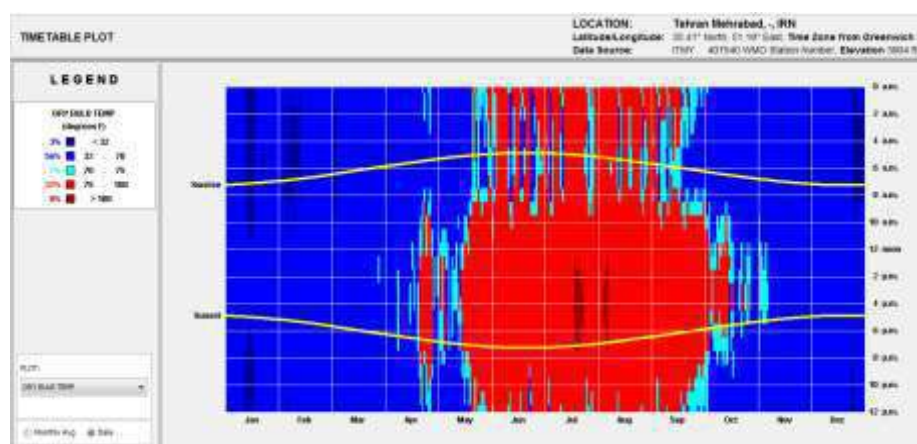
Average monthly temperature: In this table, average monthly temperature since 2000-2014 is examined, indicating that the maximum average temperature belongs to July and August and minimum average temperature to January and February.

Table 1: Information of average monthly temperatures [12].

Year	January	February	March	April	May	June	July	August	September	October	November	December
2000	4.9	6.7	11	21.3	26.6	29.3	31.5	31.4	27.8	18.4	10.1	6.3
2001	4.6	7.6	14.2	20.9	24.6	29.5	30.3	31.5	27	20.4	11.9	8.5
2002	4.6	8.8	13.7	15.5	23	28.8	31	31.6	29.5	23.6	12.5	3.5
2003	6.1	6.3	9.7	16.4	21.3	28	32.4	30.6	26.1	22.7	11.1	5.4
2004	5.7	8.7	13.7	15.3	21.8	29.4	29.6	31.9	26.9	20.5	12.7	4.2
2005	4	3.5	12.2	18.6	22.1	28.8	32.5	30	27.7	21.2	10.8	9.3
2006	1.9	8.8	13.7	18.9	24.8	30.9	31.6	31.8	26.4	21.1	10.8	2.9
2007	4	7	9.1	16.5	23.9	29.4	30.9	30.5	26.8	19.8	14.1	4.4
2008	-3.3	4.1	17.1	20.7	24.3	29.4	31.8	30.7	27.2	20.4	10.7	5.5
2009	4.4	8.2	13.6	13.7	23.5	27.4	32.3	30.6	25	19.9	11.7	7
2010	8.3	8.4	14.5	18.2	23.7	31.1	33	29.9	26.5	23	13.3	10.1
2011	3.9	6.1	10.5	18.9	24.2	30.5	32.7	30.5	26.3	18.9	7.4	5.3
2012	4.7	3.6	9.1	18.2	24.7	28.9	31.1	31.5	26.4	20.2	12.6	6.1
2013	5.9	8.2	14.2	15.9	21.5	27.7	31.7	30.8	29.6	21.4	14	7.9
2014	7.3	6	11	18.8	24.4	28.9	30	32.7	27.4	19.2	9.4	6.9

3.2. Plot timetable graph

In this diagram, two horizontal curves are sunrise and sunset. The horizontal axis is month and vertical axis shows hours and a big stain in the middle is the heat.



3.3. Position and angle of sunshine at latitude 35°

According to Figure 4, the angle and position of sun in July - October - March - April were reviewed.

On June	hour 12	Sun angle 180°	position of the sun N 80°
October	hour 12	Sun angle 58°	position of the sun N 180°
March	hour 12	Sun angle 47°	position of the sun N 180°
April	hour 12	Sun angle 58°	position of the sun N 180°

3.4. Wind in Tehran

According to the monthly maximum wind speed is in Tehran in June - May - April and the lowest monthly wind speed is in December and November.

Table 2: Information of average monthly wind speed [13].

Year	January	February	March	April	May	June	July	August	September	October	November	December
2000	2.1	2.9	4	3.4	3.6	2.8	2.3	2.1	2.2	1.8	1.7	1.2
2001	1.3	2.8	2.1	3.7	3.1	2.9	3	2.5	2.3	2.2	1.9	1.2
2002	1.9	3.4	3.2	3.7	4.2	3.9	3.1	2.5	1.7	1.8	1.7	2.2
2003	1.9	2.8	3.3	3.3	3.1	3.4	3.1	2.4	2	2.3	2.4	2
2004	1.9	3.2	2.4	3.2	4	3.3	3.2	2.9	2.6	2.5	2.6	1.8
2005	2.2	2.5	4.1	3.5	3.7	3.4	2.9	2.7	2.2	2.1	1.7	1.4
2006	1.9	2.8	3.1	3.4	3.5	2.6	3.1	2.3	2.4	2.7	2.6	1.8
2007	1.9	3	3.6	3.1	3.2	3.3	3.1	2.6	2.2	1.9	2.2	1.9
2008	1.5	2.6	3.5	3.4	3.9	3.4	3.1	2.6	2.8	2.7	2.3	1.8
2009	2.3	3.6	4	3.4	3.4	3.1	3.4	3	3.1	2.2	2.9	2.2
2010	3	2.9	3.2	4	4.2	3.2	3.1	2.6	2.5	2.6	1.4	1.8
2011	2	3.6	2.9	3.9	4	3.8	3.3	3.2	2.7	3.1	2.3	1.9
2012	2.8	2.9	4.4	3.4	4.1	3.3	3.1	2.7	2.7	2.6	2.1	2.2
2013	2.8	3	3.8	3.5	4.2	3.9	3.4	3.2	3.1	2.8	2.1	2.8
2014	2.8	2.6	4.1	3.9	3.8	4.1	3.4	3.1	3.1	3.4	2.3	2.2

- 3.5. Direction of prevailing winds and maximum wind speed
According to Figure taken from Kasmaee book on April 13 to May 11 and a maximum speed of the prevailing wind is 12.4 from the West. In May and June, wind speed is 11.4 from the West, in May and June the speed is 6.2 from Southeast and in June is 6.8 from the southeast, in July and August, it is 5.9 from the southeast, in August and September it is 5.9 from the southeast, in September and October it is 5.9 from the northwest, in October and November it is 4.9 from Southeast and in November and December it is 9.8 from the southeast - in December and February is 3.9 from southeast and February and January is 11.1 from the southeast, in February and March it is 11.6 from the southeast, in March and April the speed is 12.7 from the Southeast.

The following table also shows the direction and speed of the maximum monthly wind since 2000-2014

Table 3: Information of monthly maximum wind direction and velocity [12].

Year	January			February			March			April			May			June			July			August			September			October			November			December		
	speed	dir	day	speed	dir	day	speed	dir	day	speed	dir	day	speed	dir	day	speed	dir	day	speed	dir	day	speed	dir	day	speed	dir	day	speed	dir	day	speed	dir	day	speed	dir	day
2000	14	270	7	12	280	26	17	270	15	24	270	19	14	270	3	20	30	17	10	150	7	16	180	7	15	270	5	10	270	1	15	260	28	12	300	16
2001	11	250	13	15	230	21	20	240	25	17	270	9	20	270	16	14	270	1	15	270	20	15	300	10	15	260	17	16	270	21	15	270	18	14	270	21
2002	16	270	31	18	270	16	17	260	6	20	270	18	20	270	3	14	270	7	15	250	26	8	120	6	10	300	22	14	270	29	15	270	12	12	170	22
2003	14	270	7	16	270	26	15	270	8	20	330	10	20	270	15	15	260	6	10	260	31	18	270	22	10	260	13	20	270	3	16	290	21	15	280	21
2004	12	270	15	20	280	15	15	270	3	15	270	1	17	250	17	15	210	21	15	270	6	10	150	7	10	270	4	15	300	14	17	270	28	10	270	17
2005	13	270	25	15	270	22	15	270	21	18	270	5	15	300	9	14	250	7	10	260	7	15	270	14	8	270	6	16	300	7	15	260	6	12	240	20
2006	10	240	17	14	270	28	17	300	27	20	240	22	25	270	17	10	270	30	12	150	8	10	250	13	13	240	27	16	270	19	15	280	7	16	270	8
2007	16	270	17	15	280	5	20	300	6	20	300	27	20	240	12	18	270	3	16	270	19	10	130	22	8	160	1	13	270	18	14	300	12	14	280	20
2008	10	260	28	15	280	20	23	290	15	16	270	30	16	280	3	16	260	3	14	260	24	14	40	25	20	270	10	11	350	1	10	270	21	9	270	13
2009	13	270	2	14	250	2	20	120	30	16	230	30	15	280	17	15	210	10	10	270	6	14	140	18	13	280	17	8	240	25	14	240	3	13	280	15
2010	15	270	21	13	290	22	15	260	21	18	290	23	19	280	7	12	90	21	11	270	15	9	130	25	12	270	15	12	250	12	8	250	1	14	260	14
2011	12	270	28	13	260	22	17	240	29	16	270	26	23	270	19	14	160	23	15	270	21	14	310	25	9	280	20	14	270	4	12	270	21	11	270	11
2012	14	250	3	14	250	2	26	320	18	25	290	17	15	300	24	15	300	30	10	270	31	12	120	1	9	280	23	24	260	12	11	240	14	10	270	7
2013	14	270	30	13	270	13	15	270	19	18	270	21	20	280	16	15	280	2	12	270	3	13	270	31	12	260	25	10	270	8	10	280	30	14	270	10
2014	17	280	31	12	240	28	15	250	31	12	240	1	19	240	24	30	270	2	10	270	28	10	10	19	13	270	23	15	270	20	13	240	3	12	270	2

3.6. Number and direction of wind

Based on the charts and tables presented, highest percentage of wind is in summer in the Southeast Front. In winter we have highest wind in West Front, in spring we have highest wind in West Front, we have the highest wind in the autumn in Southeast - South - West and North Fronts and we have about 20% of wind in West - 12% in southeast -10% in South -7% in Southwest - 5% North- 5% in Northwest and 3% in Northeast. West wind > South wind > North wind

Role of climatic elements in building

5.1. Impact of sunshine on building

Sunshine create natural lighting inside the building but since the high amount of its high and unnecessary amount cause disorder in thermal comfort of humans, therefore its infiltration into the building should be prevented. Sun control in high-rise buildings has always been debated. Because heat loss in cold cases and heat absorption in hot times increases the cost of heating and cooling in a high floors.

5.2. Sun radiation on horizontal surfaces

Horizontal surfaces and flat roofs, in summer receive the highest and in winter the lowest amount of direct sun radiation. This amount, even in winter is less than the amount of radiation the southeast and southwest walls receive in this season [8]. And the impact of radiation depends on the type of roof and its material.

5.3. Sun radiation on window

Because of the transparency – low thickness and material, windows have very low resistance compared to the wall to absorb heat and enter high temperature into the indoor space. In high-rise buildings, due to the high area of windows, issue of the heat absorbed and the lost heat is very important and the radiation depends on the direction and type of windows.

Impact and performance of wind in indoor and outdoor

Air flow around a building: When the air flow encounters obstacles, such as tall buildings and is directed to the sides of the building and moves again in its direction and creates positive and negative pressures in front of wind and behind the wind. (Figure 4) and sharp corners of facades increase the flow (Figure 5). If there is empty and full spaces in the form of buildings and there is oblong in the corners, the speed of the flow is reduced. (Figure 6)

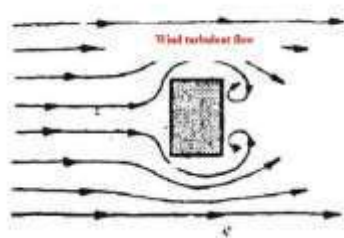


Fig. 4: Airflow around building, Source: Architectural Design Guide, Talebi

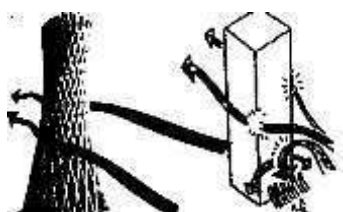


Fig. 5: Wind encountering with building, source: criteria and process of designing tall buildings, Rezazadeh

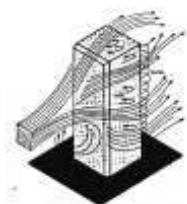


Figure 6: Various air flow around building, Source: Architectural Design Guidelines, Talebi

Performance of ventilation and need for it in building: Natural ventilation and indoor air exchange rate are the primary factors determining health and comfort of human. In general, natural ventilation inside the building has three different functions that are as follows:

- Supply of breathable air inside the building through replacing external fresh air with polluted and consumed air
- Physical comfort by raising the reduction of excess body temperature caused by evaporation of sweat on the skin.
- Developing physical comfort inside the building through the cooling the mass of building materials when the air inside is warmer than the air outside [8].

6.1. Stability in the building

In climatic design, solar and wind energy can be used especially in high-rise buildings to reduce energy consumption and utilizing light and heat.

Use of solar energy: Enjoying more sun to provide lighting - heating - and, if necessary, electricity supply of buildings [6]. Use of wind energy: The use of wind energy in high-rise buildings due to the height of these buildings and high wind speed and intensity at altitude than low buildings has a higher efficiency. The use of this energy in natural ventilation of tall buildings (Atriums) and in the generation of electricity by wind turbines include solutions that are used in these buildings for sustainability [10].

6.2. Designing a house in harmony with climate

According to the analysis conducted about Tehran climate and relationship of climatic elements in designing building, features that a building must have to be in the thermal comfort are examined. Appropriate form of building: The more compact and denser the shape of the building is, thermal energy waste will be less and for better performance and efficient use of sunshine, building can be placed along the east-west axis to be less exposed to intense and stunning West and East sun. This creates comfort and satisfaction of residents in the building. Figure 8 shows different forms of tall buildings against wind power and Figure 7 shows suitable forms for high-rise buildings against lateral forces.

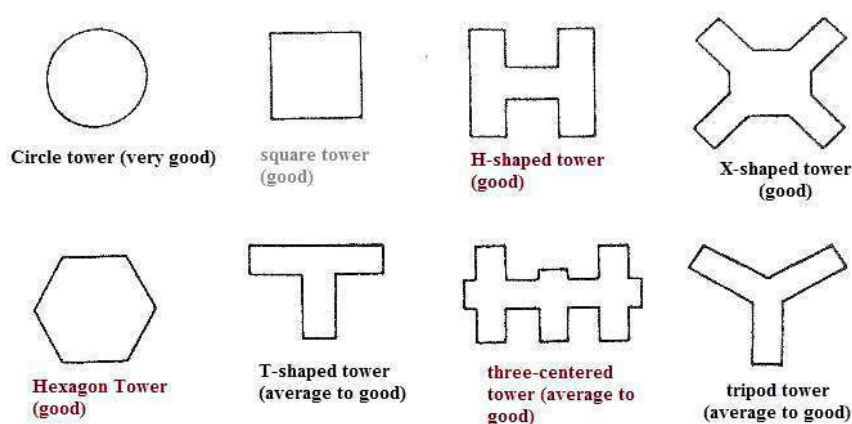


Fig. 7: Schematic forms of apartment buildings against wind power, Source: Architectural Design Guidelines for high-rise residential buildings, Talebi

6.3. Suitable direction for building deployment

To determine the direction of the building due to climatic factors, the following two points should be considered.

- Taking advantage of the cooling effect of wind and avoiding the sun during hot times
 - Taking advantage of the sunshine and stay protected from the wind in cold conditions
- Skylight through East and West, facilitates the use of sunlight for apartments during hours of the day. But due to the extreme and dazzling heat and light of the West sun, appropriate controls should be carried out in front of it. The role of wind also is important in determining the direction of the building. To study the effects of wind in buildings, information about the direction, speed and time of local winds were studied [11]. With respect to the sunshine and wind, the best direction to establish building in accordance with Figure 8, is 22.5° southeast.

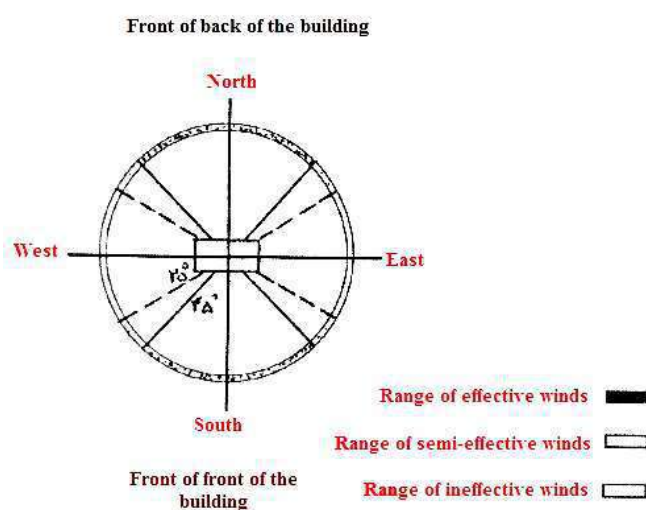


Figure 8: Direction of building, Source: Architectural Design Guideline, Talebi

6.4. Appropriate materials

Olegi method: In hot and dry areas, due to the large difference in day and night temperatures, building materials must be chosen carefully. In these areas, the best result is achieved when parts of the building that will be used during the day, is built with heavy materials and parts used in the evening and night, with light materials with low thermal capacity [8].

Geoni Method: Selection of Materials in hot areas: The most important factors determining the characteristics of building materials suitable for hot regions, is the maximum daily temperature and amplitude of its fluctuation. The amount of solar radiation absorbed in the wall is another important factor which depends on exposure and color of the external surface of the wall. The main characteristics of building materials depend on its thermal resistance and heat capacity. The best walls in warm areas are combined walls including an insulating layer close to external surface and a layer of heavy materials in the inside [8].

The use of Canopies: Canopies are very influential in preventing the penetration of heat into the building. They are divided into two categories: indoor and outdoor. Blinds and curtains are indoor canopies and fixed and moving are outdoor canopies.

Outdoor canopies: Animated canopies necessarily can be used in the case of heat out of the comfort zone. The darker the color, they will be more efficient. However, fixed canopies have specific performance and they can be used due to the building direction. Vertical canopies are generally installed for western and eastern walls and horizontal canopies for south and north walls.

Indoor canopies: The performance of the canopies is radiation reflection that is entered into the room space from the windows. Actually blinds and curtains are not effective means to control sunlight that's why they enter a lot of energy into the interior space and exit less energy due to the long wavelength of the radiations

from the window and the space between the glass and blinds will be very hot and the brighter its color, it is more efficient.

Using Atrium: Use of Atrium is one of the common ways in high-rise buildings which in both seasons (hot - cold) works appropriately to stabilize the building [6]. In the winter, atriums are spaces to store heat and in summer they do conditioning and remove the smoke.

Using photovoltaic cells: Photovoltaic cells are one of the most widely used applications of new energy. Lighting of buildings can be provided using photovoltaic cells. By calculating the energy required for lighting the building, the number of photovoltaic panels and storage capacity will be determined [6].

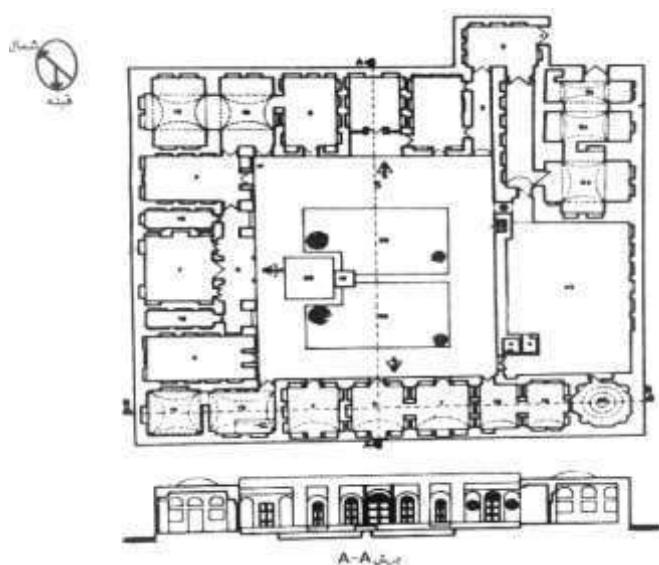


Fig. 9: Talkhonchah Village Plan - Source: comfort in light of architecture, Razjouyan
- Dividing the house into two parts: hot and cold
- Creating a central courtyard

The need for high-rise building strategy, due to increasing population growth, housing shortage and limited suitable land in the present time is increasingly seen. On the other hand high-rise building should be based on climatic conditions of the region. For this purpose, this study analysed the climatic data from meteorological stations to assess the impact of climatic parameters in district 22 of Tehran. The results of this research show that this region has a hot, dry summer and cool and dry winter as well. The results of studies show the effect of climate on architecture and sustainable architecture and analyzes that have been conducted in this regard with the aim of providing architecture in harmony with the climate and the strategies and proposals show that most appropriate place for the establishment of a residential complex in the site according to wind direction and sunlight is 22.5 degrees south-east. And form of building for a suitable use of sunshine can be compressed and with east and west stretches. Building materials to store heat and its absorption and preventing heat loss should have a high thermal capacity. Window direction - area and their number are effective in the absorption of thermal energy. Use of canopies depending on the form and direction of the establishment of building for heat absorption modulation can have a significant impact. To reduce energy consumption using photovoltaic cells for lighting and electricity of atriums are effective for conditioning and generation of heat and ultimately sustainable architecture.

Recommendations for climatic design of residential complex are as follows

- To establish building to increase the use of winter sun and reduce the effect of summer sun and reduce wind turbulence in winter and maximize the use of summer breeze in Tehran climate, it should be 22.5 south-east.
- Plan spaces should be designed according to their performance in the direction of proper sunshine.

SUPPLEMENT ISSUE

- Spaces such as warehouses and facilities should be built that are in front of the intense and dazzling sun and in fact have no well sunlight.
- The building should be divided into two parts hot and cold.
- Use of thermal insulation in windows and walls of buildings to resist heat flow.
- Selecting materials with high thermal capacity and bright color, preferably white in the summer to prevent heat absorption and resistance to the loss of indoor heat.
- To prevent heat loss and energy consumption in the building, use double-wall windows and walls.
- The number and size of windows in the northern, eastern, western should be reduced and southern side increased.
- Use of sun shades for the windows that are exposed to high heat. Canopies are divided into two categories: internal including curtains and blinds and externals including fixed and mobile.
- Use atrium for ventilation and heat absorption inside the building to reduce energy consumption.
- Use windbreaks to prevent the annoying winds.
- Use vegetation to cool the area – avoiding unfavorable winds and causing shadows besides the building.
- Use solar collectors on the roof or walls that receive a lot of heat.
- Use lawns on roofs and terraces and landscaping to create the suitable climatic conditions.

REFERENCES

- [1] Pourjafar, Mohammad Reza - Hadi Mahmudnezhad [2007]. The effect of natural factors in reducing energy consumption of housing - a topic on the commitment and climatic design with an emphasis on cold regions of Iran - Journal of Civil Engineering. No. 42.
- [2] Ramezani, Rasoul, [2008]. Climate and architecture of Zanjan, a Master's thesis, Islamic Azad University, Science and Research Branch of Tehran.
- [3] Saligheh, M. [2004]. Modelling of housing construction in accordance with climatic factors of Chabahar. Geography and development 2: 4, 147-170.
- [4] Yeang, Ken [2007]. "Designing The Eco-skyscrapers: Premises for Tall Building Design", The Structural Design of Tall and Special Buildings 16; URL: <http://www.interscience.wiley.com>.
- [5] Wener R, Carmalt H [2006]. "Environmental psychology and sustainability in high-rise structures", Technology in Society 28; URL: <http://www.elsevier.com/locate/techsoc>
- [6] Golabchi, Mahmoud, Mastari Farahani, Najme [2012]. Conceptual design of tall buildings, Tehran, Tehran University Press
- [7] Watson, Donald, Labs, Kent [1993], Vahid Qobadian, Mohammad Feiz Mahdavi, climatic design, Tehran, Tehran University Press.
- [8] Kasmaee, Morteza [2003]. Climate and architecture, Tehran, Khak publication.
- [9] Razjouyan, Mahmoud [2009]. Comfort in the light of architecture in harmony with climate - Tehran - martyr Beheshti University Press.
- [10] Golabchi, Mahmoud, Golabchi, Mohammad Reza [2012]. Principles of designing tall buildings, Tehran, Tehran University Press.
- [11] Talebi, Jaleh, Kalantari, Iraj [1996]. Architectural Design Guidelines for Residential High-Rise Buildings, Tehran, Housing and Urban Development Research Center.
- [12] Information Base of Tehran Meteorological Organization. www.tehranmet.ir.
- [13] Information Base of Tehran District 22 Municipality. region22.tehran.ir
- [14] Plan and Budget Organization [1995]. Procedures to protect buildings against fire - Tehran - Publication 112

ARTICLE

SEISMIC ANALYSIS OF CONCRETE-FACED ROCK-FILL DAMS (CFRDS) WITH REGARD TO THE NONLINEAR BEHAVIOR OF THE DAM BODY AND CONCRETE COATING

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ABSTRACT

Due to its nature and its effect on the structural response, and also experiences of past events, earthquake is of a particular importance among the factors influencing the behavior of the dam and its damages. Concrete-faced rock-fill dams are the types of dams with concrete slabs in the upstream slope as the sealing component. Like earth dams, these dams also have a conventional design. However, their dynamic analysis is different from earth dams or even rock-fill dams with impermeable core and it has been less studied. In this study, a two-dimensional numerical modeling of concrete rock-fill dams was carried out using ABAQUS finite element program and also, modal analysis of numerical modelling and calculation of attenuation coefficients was done using Rayleigh method. Then, two appropriate earthquake records were selected as the input stimuli for the dynamic study and then nonlinear time history analysis was performed on the model of the dam for two situations of the empty tank and a tank full of water using PLAXIS software. The results indicate that in the empty tank situation, under the Northridge earthquake records with respect to the maximum axial tensile stress developed in the concrete face, occurrence of tensile cracking is possible at elevations from 13/35 to 104/91 meters from down the dam. In addition, tension did not exceed the tensile strength of concrete at any points of the concrete face during Sakaria earthquake.

KEY WORDS

Rock-fill dam, concrete face, seismic analysis, modal analysis.

INTRODUCTION

Given the importance of dams due to social, economic and political issues, the safety of these large structures has been highly of interest. Dam safety should be checked periodically. Due to its nature and its effect on the structural reaction, and also experiences of past events, earthquake is of a particular importance among the factors influencing the behavior of the dam and its damages. Concrete-faced rock-fill dams are a variety of dams that have been considered as an amenable option in recent years when compared to earth dams, rock-fill dams with clay core, and concrete arch dams in certain circumstances, and they are also considered to be a superior option in many cases. However, less attention has been paid to the dynamic response of this type of dam considering its various aspects such as concrete face, and interaction of the dam body and its concrete face. The occurrence of such cracks is possible even under normal loads due to the low tensile strength of the concrete. In this study, two appropriate earthquake records were selected as the input stimuli for the dynamic study and then nonlinear time history analysis was performed on the two-dimensional model of the dam. And, the axial stress generated in the concrete face of the dam, as well as, displacement, velocity and acceleration responses at a point near the dam crest are investigated.

LITERATURE REVIEW

Concrete-faced rock-fill dams have been offered as an appropriate and economic option in 1970 and since then, they have been designed and performed in many parts of the world. Concrete-faced rock-fill dams are one of the types of rock-fill dams in which a concrete face on the upper slopes prevents the passage of water.

Concrete-faced rock-fill dams are composed of three parts of rock-fill, concrete face slab, and concrete toe slab. The main body of concrete-faced rock-fill dams is formed by various layers of rock-fill materials with different grain size in which each layer has its own function and feature. However, in regard to the mechanical properties (modulus of elasticity), they are more or less similar and regarded as uniform in the stress-strain analysis. Thickness of concrete face slab is determined based on past experiences, i.e. a thickness of 25 to 30 cm is proposed for dams with a height of less than 100 m; and for high or major dams, the face thickness is calculated by the formula of $0/3 + 0/003 H$ where H is the dam height. However, in the case of better quality of construction, lower thicknesses can also be used [1].

Dam sealing is the task of the concrete face slab which is implemented on the upstream level. Thickness of concrete face slab is usually between 30 to 40 cm and it increases as the height of the slab thickness is increased in more dams. The used concrete is the conventional concrete with a compressive strength of 20 MPa. Usually, concrete slab is reinforced in two directions. Concrete face reinforcement is done for controlling the crack due to temperature changes or concrete shrinkage. Percentage of steel has been suggested to be about 0/35 to 0/4 percent. Armature system is usually placed in a row slightly above the central line of the face [2]. Horizontal reinforcements pass through vertical seams continuously so that no defect is created in the concrete as a result of the sealing installation [3].

The main purpose of constructing concrete toe slab is connecting the concrete face to the foundation. This slab is usually built on the solid and grouting foundations. The width of the slab is about 0/04 to 0/05 of reservoir water level and its minimum width is about 3 meters. The minimum slab thickness is from 0/3 to 0/4 meters [4]. The stability of this slab is very important. For the purpose of enhancing this sustainability,

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sometimes anchors of 25 to 35 mm in diameter and 3 meters in length are used to connect the slab to the stone floor. On the other hand, these anchors prevent the slab from rising when they are grouted [2]. The toe slab should be reinforced in order to control the cracking due to heat changes and applied bending loads during the grouting. According to Cook and Sherard (1987), it is appropriate to place 0/3 percentage of the steel in 10 to 15 cm below the central line of the slab [4].

The first CFR dam was built in California in 1895. This dam was built following the construction of wooden face rock-fill dams in the 1850s [Fell et al, 1992]. In the 1950s, the development of this type of dam was slowed down due to the water seepage and lack of subsidence control. But in the 1960s, development of this type of dam accelerated with the construction of large vibratory rollers and growth of rock-fill compaction technique, and consequently, tall dams were constructed [5]. Before that time, tall dams which were built with no rock-fill compaction faced with problems in relation to the concrete surface.

Research and studies on the design, development and behavior of CFR dams do not have a very long history. However, the analysis of the dynamic behavior of CFR dams has been less concerned compared to construction and operational issues.

Uddin (1999) has suggested a simple calculation method with which stresses created in the slab can be calculated manually. The basic premise of this approach is that the deformation of the slab is a function of the bending deformation of the dam body [6].

Haeri and Esfahani (2000) also analyzed a CFR dam with a height of 100 meters through a two-dimensional modelling using ANSYS software. In their analysis, they defined the behavior of rock-fill materials based on a combination of Cam clay and Drucker-Prager model and used the contact elements of ANSYS software to model the possible slip between the slab and the body. They also stimulated the dam by the two earthquake records, namely, El Centro earthquake (1954) with the PGA of 0/35g, and Manjil earthquake (1990), the PGA of 0/53 g and thus came to the following conclusions [7]:

1. The induced acceleration in the upper one-third of the dam is significantly greater than the base bedrock acceleration.
2. A part of the concrete face slab including 20% of the upper slab length developed the resonance phenomenon up to 2.7 times the base stone floor acceleration due to earthquake. As a result, uplift phenomenon (detachment) of concrete face slab has been observed at some dewatering levels.
3. There is the possibility of tensile cracking in the concrete slab due to the axial force generated in it.

Haeri et al (2007) performed the two- and three-dimensional analysis of a sample rock-fill dam with a height of 100 meters using ANSYS software. Non-linear behavior for rock-fill materials was considered multiline using kinematic hardening model and the boundary between the slab and the body was modelled to level 1 using the contact point element. At the end, the results of two- and three-dimensional analysis were reported as follows [8]:

1. The first free vibration frequency of the three-dimensional model of is less than that of the two-dimensional model.
2. Location shifts and the maximum major stresses in the concrete face in the three-dimensional induced acceleration are more than the two-dimensional model.
3. Slab uplift phenomenon can be seen in both the two-dimensional and three-dimensional models. But the amount of uplift is more in the three-dimensional model.
4. In the three-dimensional model, the maximum induced acceleration does not necessarily happens in the middle section of the dam.

Wieland (2007) conducted a study on the seismic performance of CRF dams and reported that the dams experience a maximum subsidence of 0/5 to 1 meter during the Strong Motion. Typically, the general assumption in the dynamic analysis of dam is that uniform excitation is applied throughout the site. This assumption can only be true in special cases such low frequencies in which the verified wavelength is quite large compared to the dimensions of the dam. But, in practice, in addition to components with high-frequency and low wavelength which make uniformity of excitation throughout the site anyway, other factors such as the wave approach angle and the valley shape of dam cause that the excitation experienced in different parts of the valley be different in terms of amplitude, phase and even frequency content [9].

RESEARCH METHODOLOGY

Introduction to ABAQUS finite element analysis (FEA) software

For the purpose of modal analysis of the dam structure, the numerical model was built in ABAQUS software and it was evaluated. ABAQUS is a powerful suite of engineering simulation programs based on the finite element method than can simulate problems ranging from relatively simple linear analyses to the most challenging nonlinear simulations. ABAQUS contains elements that can model any geometry. It also consists of an extensive list of material models that can simulate the behavior of most typical engineering materials including metals, rubber, polymers, composites, reinforced concrete, crushable and resilient foams, and geotechnical materials such as soils and rock. An ABAQUS model is composed of several different components in which the analysis model consists of the following information: discretized geometry, element section properties, material data, loads and boundary conditions, analysis type, and output requests.

In dynamic analysis, the waves generated by the material damping lose their energy. Thus, Rayleigh damping in ABAQUS software can be used to define a general damping for the system. For this definition, two main factors of Rayleigh damping are required to be specified: α_R for the *mass-proportional damping*, and β_R for the *stiffness-proportional damping*. For a given mode i , critical damping based on the two mentioned parameters is as follows:

$$\xi_i = \frac{\alpha}{2w_i} + \frac{\beta w_i}{2} \quad (1)$$

This equation implies that the *mass-proportional* Rayleigh damping (α_R) damps low frequencies, and the *stiffness-proportional* Rayleigh damping (β_R) damps higher frequencies.

The α_R factor introduces damping forces caused by the velocities of the model and indeed, it offers a damping contribution proportional to the mass matrix for an element. The β_R factor introduces damping proportional to the strain rate, which can be considered as damping related to the material itself. This parameter is defined as the damping proportional to the elastic material stiffness. But it cannot be regarded as a non-linear response to the stiffness. Since the stiffness matrix may have negative eigenvalues in some cases (which implies negative damping). This factor produces a damping tension, proportional to the total strain rate which is added to the stress caused by the system response in the dynamic equilibrium equations (but it is not included in the stress output). Given the constant critical damping at different frequencies, these two parameters can be obtained from equations (2) and (3) in the frequency range of ω_1 and ω_2 .

$$\alpha_R = \frac{2\omega_1\omega_2\xi}{\omega_1 + \omega_2} \quad (2)$$

$$\beta_R = \frac{2\xi}{\omega_1 + \omega_2} \quad (3)$$

The selected model and the results of the modal analysis

The selected Dam for the analysis in this study is Torul dam which was constructed on Harsit River in Turkey. This dam was completed in 2007. The dam reservoir is used for hydroelectric power generation, and its annual power-generation capacity is 322/28 GW. The dam crest is 320 meters long and 12 meters wide. Its maximum height and base width are, respectively, 142 and 420 meters. Slope of the upstream face is 1:1/4055 and slope of the downstream face is 1:1/50. The concrete slab thickness is 0/3 meters at the crest level and 0/7 meters at the foundation level [10]. The Torul dam body consists of a concrete slab, transition zones of A2 and A3, and rock-fill zones of B3, C3 and D3 respectively from the upstream to downstream. These zones are arranged from the upstream to downstream areas from smaller to larger grains. The largest two-dimensional cross-section of the dam is shown in Figure 1.

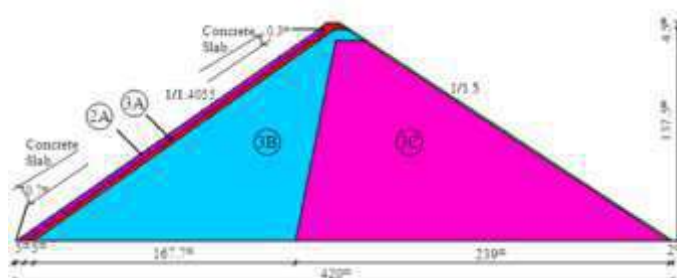


Figure 1. Two-dimensional cross-section of CRF dam [10]

In the following figures, 2 normal modes from the first 10 normal modes of modelled structure vibration in ABAQUS are shown in two forms, i.e. with foundation (Figure 2) and without foundation (Figure 3).

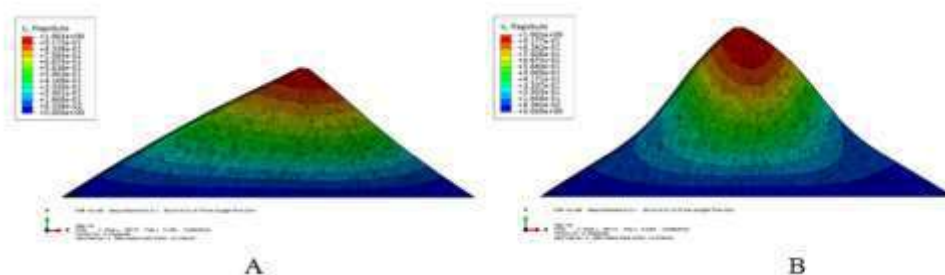


Figure 2. The first normal mode (A) and the second normal mode (B) of frequency of dam without foundation

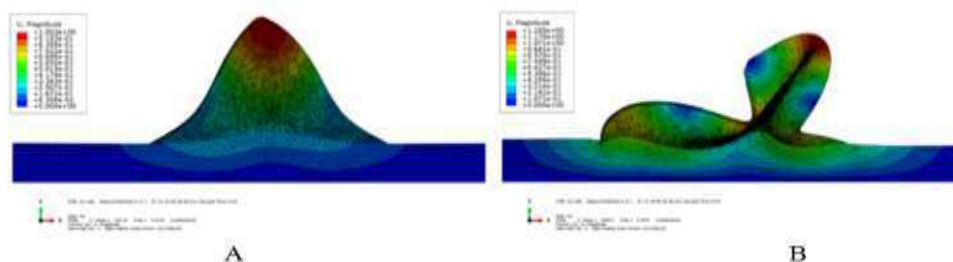


Figure 3. The second normal mode (A) and the fifth normal mode (B) of frequency of dam with foundation

According to the frequencies obtained from the modal analysis of the structure, two appropriate earthquake records were selected and their characteristics are given in Table 1. These records are related to the Sakaria earthquake with the dominant frequency of 6/25 and Northridge earthquake 3/864 with the dominant frequency. The dominant frequency of Sakaria earthquake record is between the fifth and sixth modes of frequency of dam with foundation, and Northridge earthquake dominant frequency is between the second and third modes of the frequency of the dam with foundation. Records are selected so that the dominant frequency between two frequencies is among the 10 normal frequencies of the structure.

Table 1. Attributes of the two selected earthquake records

Dominant frequency	Dominant period (sec)	Maximum displacement duration (sec)	Maximum displacement (sec)	Maximum velocity duration (sec)	Maximum velocity (cm/sec)	Maximum acceleration duration (sec)	Maximum acceleration (g)	Earthquake record
6/25	0/16	19/98	59/13548	6/32	77/36657	5/92	0/628	Sakaria
3/846	0/26	6/94	8/96614	8/16	52/02243	8/24	0/568	Northridge

Time history of acceleration, velocity, displacement, and the Fourier spectrum of the selected earthquake records is shown in the following diagrams.

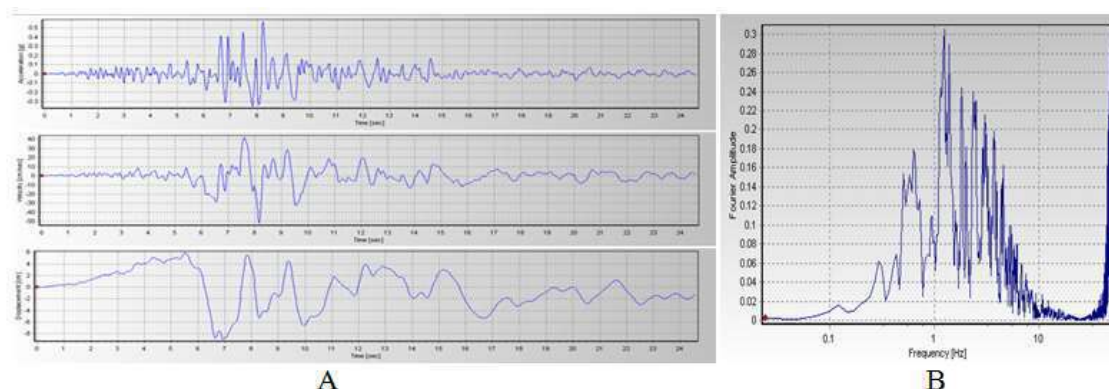


Diagram 1. Time history of acceleration, velocity and displacement (A) and Fourier amplitude spectrum (B) of Northridge earthquake record

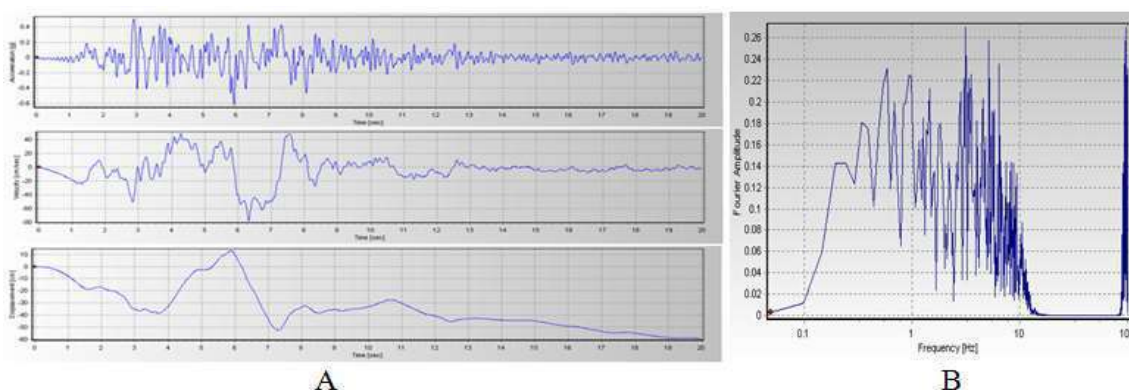


Diagram 2. Time history of acceleration, velocity and displacement (A) and Fourier amplitude spectrum (B) of Sakaria earthquake record

Methods presented in the regulations of seismic analysis and design of structures are based on two main methods of equivalent static analysis and dynamic analysis. Dynamic analysis is performed in two ways, namely, spectral analysis and time history dynamic analysis. After calculating the damping coefficients and selecting two appropriate earthquake records, nonlinear time history analysis of the dam structure has been

performed on the two-dimensional model, once with the empty tank and the other time with a full tank of water using PLAXIS software.

Soil behavioral models in PLAXIS software include:

1. *Mohr-Coulomb model (MC)*
2. *Jointed Rock model (JR)*
3. *Hardening Soil model (HS)*
4. *Soft Soil Creep model (SSR)*
5. *Softening Soil model (SS)*
6. *Modified Cam-clay model (MCC)*

Mohr-Coulomb model (elastic - plastic) is a popular model that includes 5 parameters, namely, Young's modulus, dilation angle, Poisson's ratio, soil internal angle of friction, and the cohesion. This model was used in the analysis performed in this study.

Utilizing the plane strain model

This program generates triangular elements using two 6-node and 15-node models. The 6-node elements has 3 internal nodes in which the program calculates the generated stresses and strains in the analysis phase. Moreover, the 15-node elements offers better results by having 12 internal nodes and this requires more time and greater use of computer memory. This program is recommended for two-dimensional models of using 6-node element and also for complex models of using 15-node elements. In this study, the 15-node elements are used for the modeling. The number of elements is 1205 for the dam. The finite element model used in PLAXIS program is presented in Figure 4. Also, the concrete face has been modeled as Plate with 27 "5-node" elements.

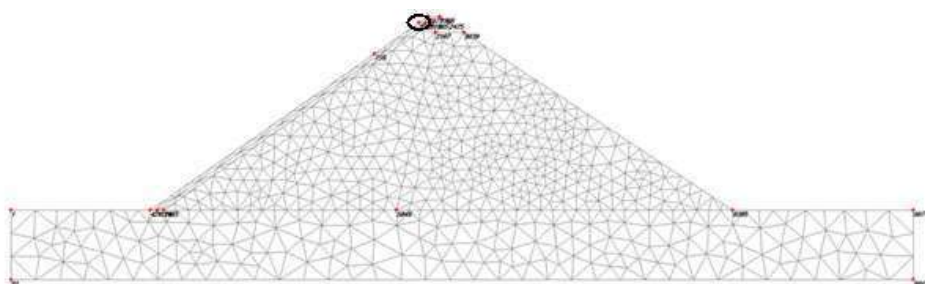


Figure 4: The finite element model used in PLAXIS program

RESULTS

In the following, the results of non-linear time history analysis on the two-dimensional CRFD model have been analyzed in the PLAXIS finite element software in two conditions of the empty tank and the full tank. Responses of acceleration, velocity and displacement have been presented for a point above the dam near the crest with the coordinates (135 and 199) which have been under the effect of Northridge and Sakaria earthquake records for 20 seconds. The mentioned point is located at the dam section in Figure 4. Also, the axial stress level generated at the concrete face is also provided. The purpose of examining the axial stress is to investigate the potential for crack generation in the concrete face.

Results of the empty tank case

In Diagram 3, responses of two-dimensional model which have been analyzed in PLAXIS software, including acceleration, velocity and displacement are presented for a point above the dam near the crest which was under the effect of Northridge earthquake records for 20 seconds.

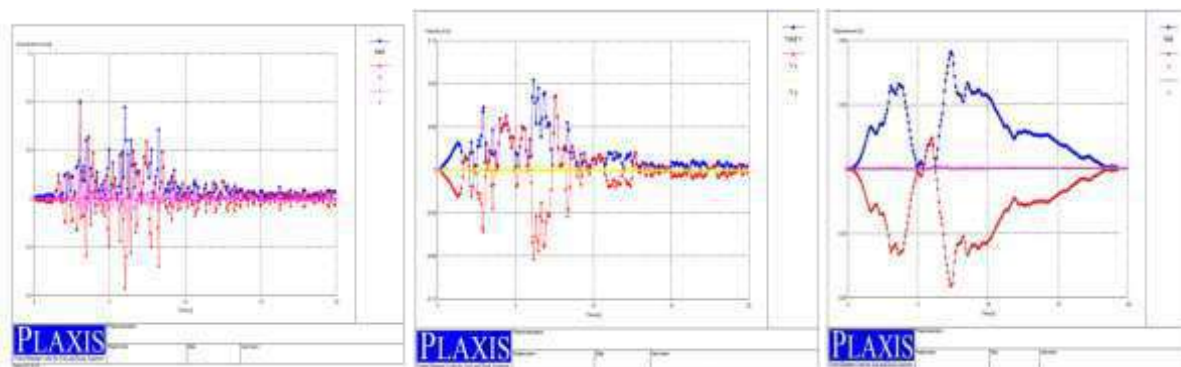


Diagram (3) Time history responses of acceleration (A), velocity (B) and displacement (C) of Northridge earthquake in the empty tank case

In Diagram 3, it can be observed that the maximum acceleration rate for a point above the dam near the crest is about 3 seconds and about 0/8 meters per second squared. The maximum velocity rate for the mentioned point is about 6 seconds and a little more than 0/08 meters per second squared, and finally, the

maximum displacement rate in the x direction for the point under study is about 7/5 sec and less than 6 cm.

In the following, the maximum axial stress rate is given for the concrete face of analyzed model in PLAXIS software under the Northridge record. The maximum axial tensile stress distribution at the top of the vertical axis of the concrete face, and the maximum axial compressive stress distribution at the bottom of it have been presented here.

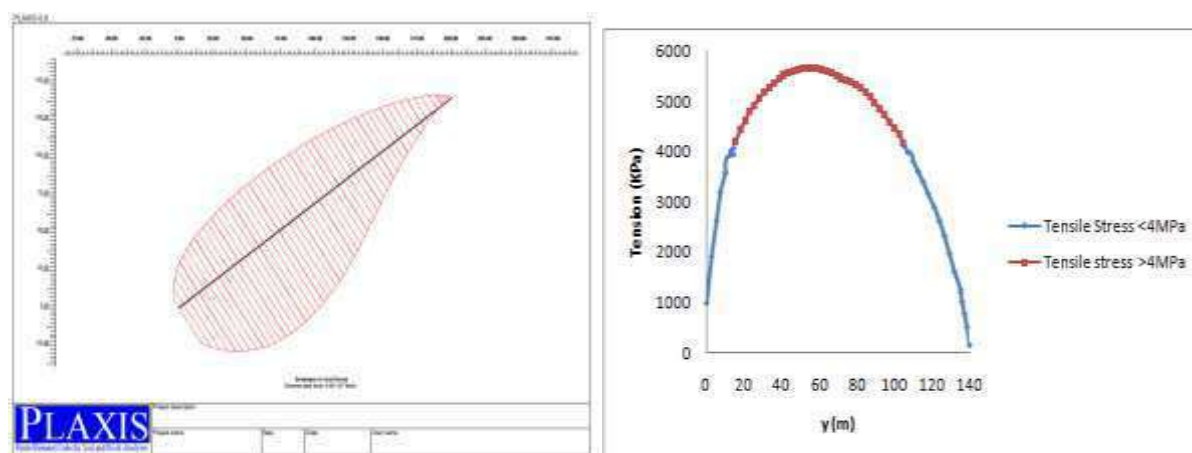


Diagram 4. The maximum axial, compressive and tensile stress rate (A) and maximum axial tensile stress (B) in the concrete face (Northridge record) in the empty tank case

The axial stress distribution is examined in order to compare the tension values in the concrete face and also to investigate the potential for crack generation in the concrete face. As previously mentioned, the cracks in the concrete face allow the passage of water through the concrete face, and in this case, the overall stability of the dam may be at risk.

The axial tensile stress rate generated in the concrete face is compared to the tensile strength of concrete which is considered 4 Mpa in order to examine the potential for the tensile crack generation. The tensile cracking is likely to occur in areas of the face where the rate of the generated tension is more than 4 Mpa. Considering the maximum axial tensile stress generated in the concrete face in elevations of 13/35 to 104/91 meters down the dam, the rate of generated tension is more than 4 Mpa. As a result, the tensile cracking is likely to occur in this area.

In Diagram 5, responses of two-dimensional model which have been analyzed in PLAXIS software, including acceleration, velocity and displacement are presented for a point above the dam near the crest which was under the effect of Sakaria earthquake records for 20 seconds.

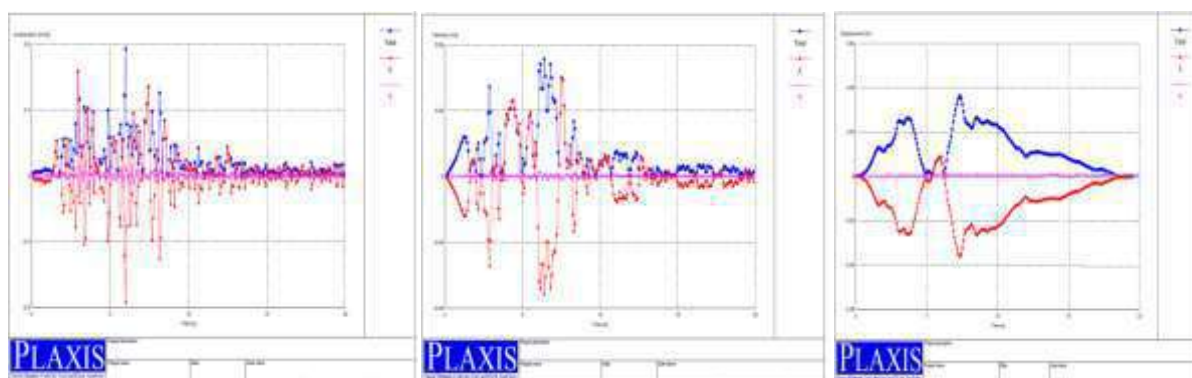


Diagram 5. Time history responses of acceleration (A), velocity (B) and displacement (C) of Sakaria earthquake in the empty tank case

In Diagram 5, it can be seen that the maximum acceleration rate for a point above the dam near the crest is about 5/5 seconds and about 0/6 meters per second squared. The maximum velocity rate for the mentioned point is about 6 seconds and a little more than 0/07 meters per second squared, and finally, the maximum displacement rate in the x direction for the point under study is about 7/3 sec and less than 6 cm. The maximum axial stress rate is given for the concrete face of analyzed model in PLAXIS software under the Sakaria record is presented in Diagram 6.

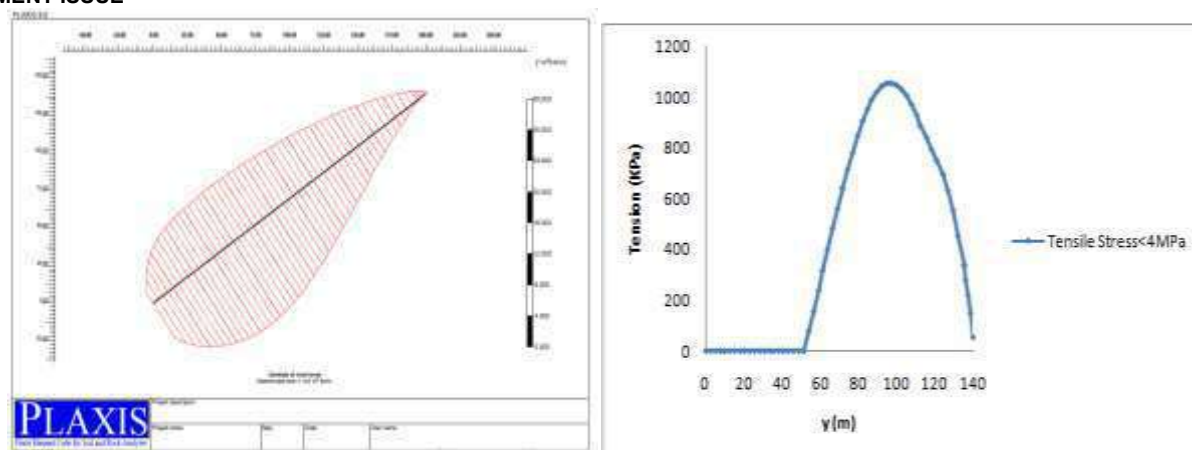


Diagram 6. The maximum axial, compressive and tensile stress rate (A) and maximum axial tensile stress (B) in the concrete face (Sakaria record) in the empty tank case

Results of the full tank case

In Diagram 7, responses of two-dimensional model which have been analyzed in PLAXIS software, including acceleration, velocity and displacement are presented for a point above the dam near the crest which was under the effect of Northridge earthquake records for 20 seconds, when 95% of the volume of the tank is assumed to be full of water.

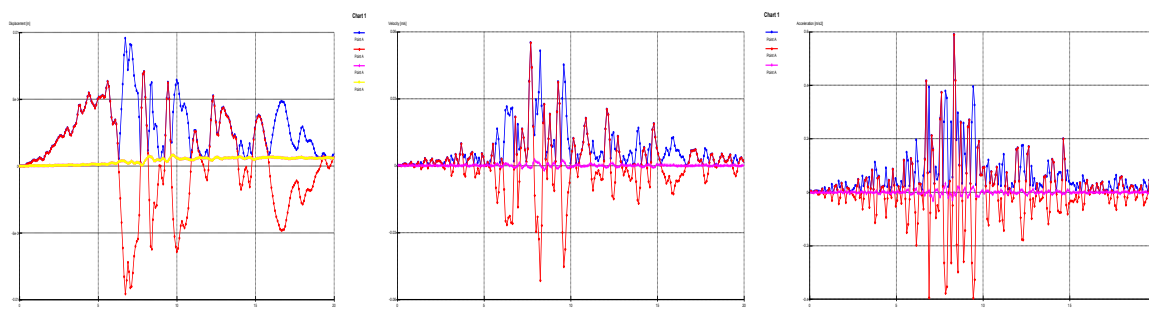


Diagram 7. Time history responses of acceleration (A), velocity (B) and displacement (C) of Northridge earthquake in the full tank case

As it can be seen in Diagram 7, the maximum displacement rate in the x direction for the point under study is about 7 sec and less than 1 cm. Also, the maximum velocity rate for the mentioned point is about 7/5 seconds and less than 0/06 meters per second squared, and, the maximum acceleration rate for a point above the dam near the crest is about 8 seconds and about 0/6 meters per second squared. Diagram 8 shows the axial push force and bending-moment envelope in the concrete face under Northridge record.

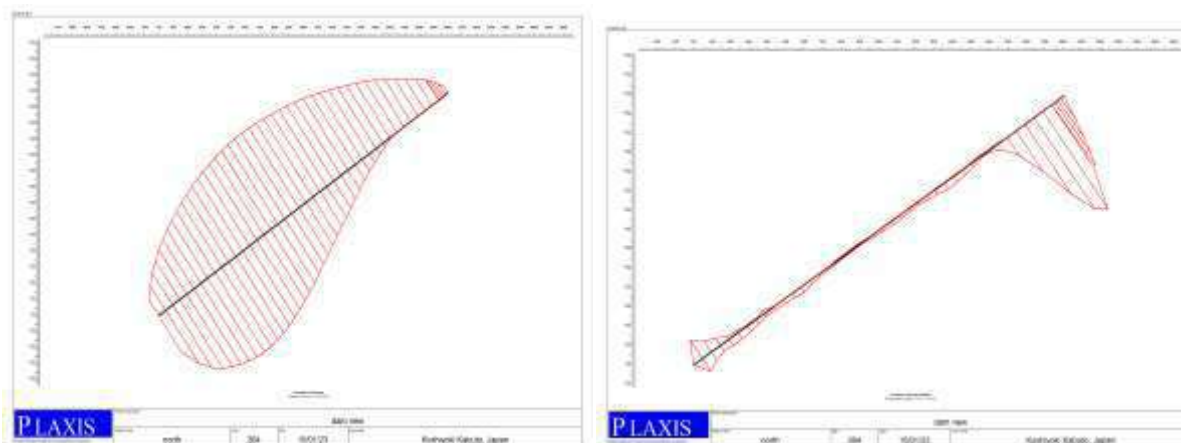


Diagram 8. Axial push force (A) and bending-moment envelope (B) in the concrete face (Northridge record)

In Diagram 9, responses of two-dimensional model which have been analyzed in PLAXIS software, including acceleration, velocity and displacement are presented for a point above the dam near the crest which was

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under the effect of Sakaria earthquake records for 20 seconds, when 95% of the volume of the tank is assumed to be full of water.

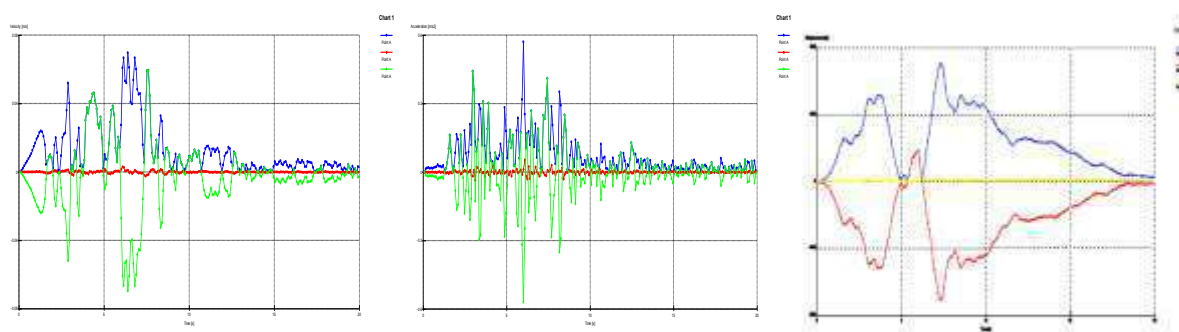


Diagram 9. Time history responses of acceleration (A), velocity (B) and displacement (C) of Sakaria earthquake in the full tank case

In Diagram 9, it can be observed that the maximum displacement rate in the x direction for the point under study is about 7 sec and less than 1 cm. Also, the maximum velocity rate for the mentioned point is about 6/5 seconds and less than 0/07 meters per second squared, and the maximum acceleration rate for a point above the dam near the crest is about 6 seconds and about 0/6 meters per second squared. Also, the axial push force and bending-moment envelope in the concrete face under Sakaria record are presented in Diagram 8.

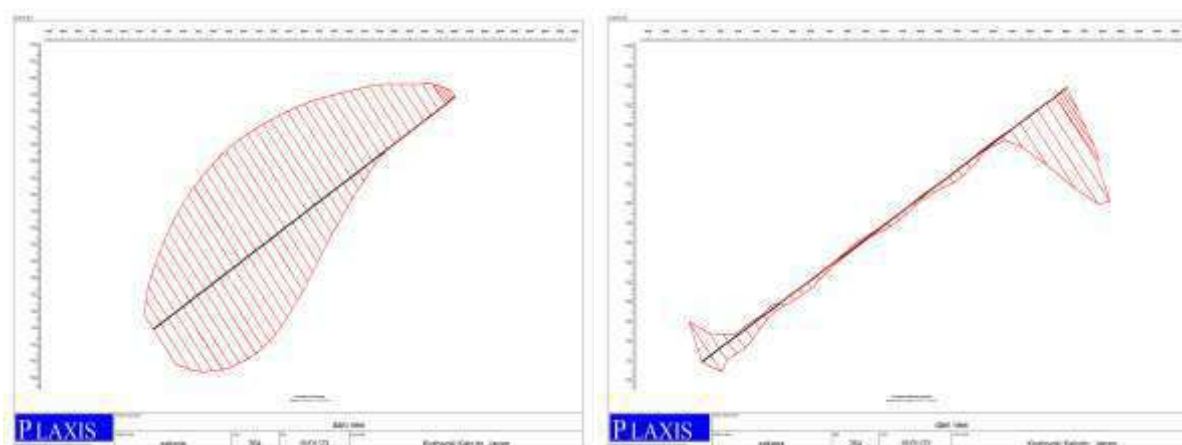


Diagram 8. Axial push force (A) and bending-moment envelope (B) in the concrete face (Sakaria record)

The free surface flow in the dam body for the two-dimensional analyzed model in PLAXIS software in the full tank case is shown in Figure 11.

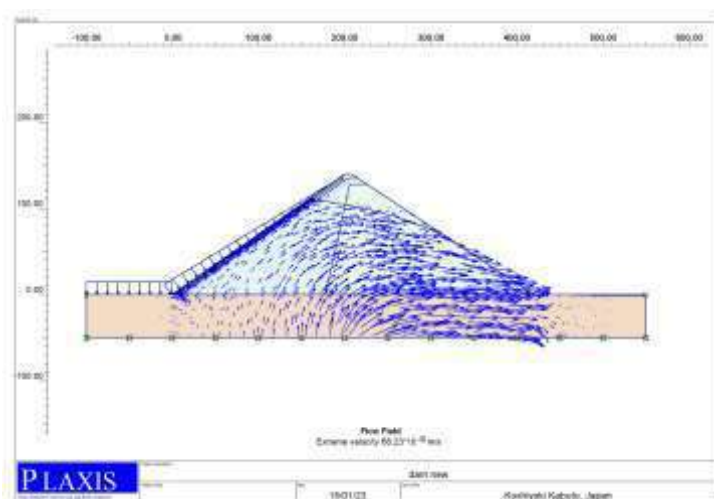


Diagram11. The free surface flow in the dam body (Sakaria record)

CONCLUSION

- In the empty tank case, the rate of the tension generated in the concrete face is more than 4 MPa under Northridge earthquake records. As a result, the tensile crack is likely to happen in the elevations of 13/35 to 104/91 meters down the dam. Moreover, the tension has not exceeded the tensile strength of 4 Mpa in any points of the concrete face during the Sakaria earthquake.
 - Under Northridge earthquake record, the maximum acceleration rate for a point above the dam near the crest was about 3 seconds and about 0/8 meters per second squared for the empty tank case. For the full tank case, it was about 7/5 seconds and about less than 0/06 meters per second squared. The maximum velocity rate for the mentioned point was about 6 seconds and a little more than 0/08 meters per second squared for the first case, and it was about 7/5 seconds and less than 0/06 meters per second squared for the second case. Also, the maximum displacement rate in the x direction for the point under study is about 7/5 sec and less than 6 cm for the first case.
 - Under Sakaria earthquake record, the maximum acceleration rate was about 0/6 meters per second squared in both cases of full and empty tank. The maximum displacement rate in the x direction for the point under study was about 7/3 sec and less than 6 cm for the empty tank case.
- And finally, the maximum velocity rate was about 0/07 meters per second.

CONFLICT OF INTEREST

Authors declare no conflict of interest.

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REFERENCES

- [1] ICOLD (1989a), "Rock fill dams with concrete facing. International committee on Large Dams".
- [2] Fell R., Mac Groger P. and Stapeldon, (1992), "Geotechnical Engineering of Embankment Dams", Balkema Publisher.
- [3] Vafaeian, M, (2005), "Rock-fill Dams" SID, Isfahan University of Technology.
- [4] Cook, J.B. and Sherard, J.L, (1987), "Concrete-face rockfill dam: I. Assessment", Geotechnical Engineering, ASCE, Vol, No.10, pp.1096-1112.
- [5] Chau, L., (2004), "A Study on Concrete faced Rock fill Dams", University of Southern Queensland, Chapter 2,3 & 5.
- [6] Uddin, N., (1999), "A dynamic analysis procedure for concrete-faced rockfill dams subjected to strong seismic excitation", Computers and Structures 7, 409-421.
- [7] Haeri, M. & Esfahani, M., (2000), "Evaluation of the effects of changes in the reservoir level on the dynamic response of CRFDs", Proceedings of the Fourth Conference of the dam construction, 804-793.
- [8] Haeri, M., & Ismaili, Sh., & Esfahani, M., (2007), "Dynamic Analysis of CRFDs in two-dimensional and three-dimensional conditions", Fifth International Conference on Seismology and Earthquake Engineering (Tehran), 8-1.
- [9] Wieland, M. (2007), Seismic Performance of CFRDs, Water Power and Dam Construction, March.
- [10] Bayraktar, A. and Krtal, M.E., (2010), "Linear and nonlinear response of concrete slab on CFR dam during earthquake", Soil Dynamics and Earthquake Engineering 30, 990-1003.