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EFFECT OF STRESS ON THE NURSES' WORK LIFE QUALITY
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ABSTRACT

Background: One of the factors influencing the quality of nurses' work life is stress. Therefore, the use of preventive and efficient practices to manage stress seems essential. So the purpose of this study is to investigate the effect of Stress Inoculation Program on the quality of the nurses' work life in the psych ward department. **Methods:** This study was a clinical trial type whose research units were constituted by 60 nurses and the healthcare working in Ibn Sina Hospital of Mashhad city who were divided into 2 groups based on random allocation. Data collection tool included a questionnaire of work life quality completed in three stages: before the intervention, at the end of the second session and one month after the intervention. The intervention included Stress Inoculation Program, consisting of workshop for 2 days and 8 hours each day with one week interval that was conducted for the intervention group. **Results:** The findings showed that the average score of work life quality of the " Stress Inoculation" group changed from 80/01 ± 13/18 at the pre-intervention stage to 86/71 ± 18/72 after the intervention and 88/32 ± 17/26 in follow up stage of one month later, which significantly is more than the control group ($p < 0.005$). In the control group, the average score of work life quality also significantly reduced at the post-intervention stage and follow up one month later comparing with that of at the pre-intervention stage ($p = 0.000$). **Conclusion:** Since Stress Inoculation Program is a cheap, safe, and effective way to improve the quality of work life for nurses, it is suggested to be used in order to improve the quality of cares.

INTRODUCTION

The main key to success of managers in achieving organizational goals and giving life back to the organization is to improve the work life quality of employees [1]. Moorhead and Griffin defined quality of working life as "the employees' ability to satisfy their own important personal needs using the experiences that have gained in the organization" [2]. In fact, the work life quality means that the organization provides a work atmosphere in which there is excellent performance, full participation, personal, professional, and organizational development and professional satisfaction [3].

In any organization, high quality of work life is essential to attract and maintain the employees but this issue has a particular importance in sustainability of the healthcare system particularly in attracting and maintaining nursing staff [4]. Kettle also states that any health system should focus on work life quality of nurses of that organization [5]. However, health care organizations have rarely investigated methods to increase efficiency in personnel levels and lots of efforts by managers to create the latest changes have been dysfunctional; so that the results of some research suggests that work life quality of nurses has acutely been disrupted and the increased medication errors have led to morbidity, mortality and dissatisfaction of patients [6]. Work life Quality of nurses is under the influence of demographic, social, cultural, environmental and field features [7]. In the meantime, another factor affecting the quality of life about which many studies have been done is stress [8]. A review of stress in workers of different health care wards in 17 countries showed that nurses experience more stress in most countries, and though they lack appropriate coping resources, they are at risk of occupational burnout more than other people and this can lead to physical and mental illness and ultimately reduce their quality of their life [9,10]. According to various studies, there is an inverse relationship between stress and quality of life [11].

Psychiatric nurses are encountered with more stressful factors due to the lack of organized structure in psyche wards, inadequate professional training and unpleasant psychological environment governing the interaction among therapeutic team members [12]. Researchers believe that the quality of work life has significant impact on nurses' reactions such as organizational identity, job satisfaction, work participation, effort and professional performance [13].

Given the key role of nurses in taking care of patients with mental disorders, paying attention to their work life quality and efforts to improve it are essential; Because nurses can favorably provide care to patients if they themselves are at a desirable level in terms of different aspects of life and work [14]. On the other hand, since the stress affects the nurses' work life quality, stress management programs can probably be useful to improve their life quality and thus maintain and improve quality of care

Recently, researchers have found in medical fields that it is better for intervention to be conducted in a preventive approach for stress management. These types of interventions to reduce stress are based on the important role of cognitive intermediaries in the development and maintenance of stress [15]. One of

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the preventive methods of management is Stress Inoculation Program, which has been proposed by Michenbum [16]. Stress inoculation as medical immunization is a cognitive-behavioral application created based on a person's exposure to stressful conditions in order to form psychological antibodies or skills to deal with stress [17]. The program includes three stages: conceptualization, acquisition and practicing the skills. At the first stage, the main focus is on making relation based on cooperation with the individuals and helping them better understand the nature of stress and its effects on excitement and operation. At the second stage, the person's skills of dealing are reinforced and new skills are also taught to him. At the third stage, the individual uses his skills to increase the ability to deal with any kind of stress as well as stronger stresses [18]. The principles of Stress Inoculation Program are that the individuals should change their beliefs about stressful behaviors as well as their self-talk about the ways of dealing with stress [19]. So far, many studies have shown the effectiveness of this method on reduction of pain, agitation, and depression and on development of professional operation [20]; it has also been reported that Stress Inoculation is more effective than methods such as cognitive behavioral therapy and support groups in controlling stress [21].

Despite the extensive search carried out, studies that measure the effect of inoculation on life quality of nurses were not found the researchers are planning to investigate whether stress inoculation program is effective on the work life quality of the nurses in psych ward?

MATERIALS AND METHODS

This clinical trial study was conducted in 1390 on the nurses and paramedics working in Avicenna psychiatric hospital in Mashhad. The study inclusion criteria were possessing an associate, undergraduate, or graduate degree in nursing, or a diploma in medic works employment at Avicenna hospital at least from 6 months ago, lack of consuming effective psychiatric drugs, no days off more than two weeks in the past month and exclusion criteria were absence during more than 10% of the time in the workshop, participating in other stress management workshops, discharge or transfer to other hospitals and exposure major to stress (death of someone close, divorce, etc.) when running the study.

The hypothesis of this study: Stress Inoculation Program increases work life quality of psych ward nurses. The sample size of this study achieved using the proportions formula

$$n = \frac{(z_{1-\alpha/2} + z_{1-\beta})^2 (s_1^2 + s_2^2)}{(\bar{x}_1 - \bar{x}_2)^2}$$

and with confidence coefficient of 95%, accuracy of 05% and test power of 80%, and 25 patients in each group which given the possibility of research units loss, 32 patients were considered for each group (64 people total). After coordination with the educational supervisor for conduction of the intervention, ads to register for the Stress Inoculation workshop were installed in different wards of the hospital; From among 72 nurses and 32 hospital paramedics, 64 eligible people for the study voluntarily registered to participate in the research. After homogenization in terms of work shift and responsibilities, the participants were randomly divided into two groups of test (n = 32) and control (n = 32) on the basis of registration number. Finally, with the loss of research units, 60 people (30 in the test group and 30 subjects in the control group) participated in the study.

The tools used in this study included demographic characteristic form and work life quality questionnaire of Dargahi and colleagues. Demographic characteristics questionnaire included information 16 questions about individual and occupational characteristics that was provided according to the objectives of the research and studying the latest resources and related articles. Work life quality questionnaire contains 30 questions and each question was regarded as a component related to the quality of work life. Scoring each phrase was as completely dissatisfied phrases (1), dissatisfied (2), no comment (3), satisfied (4) or quite satisfied (5). In this scale, the minimum score for the satisfaction of life quality is 30 and the maximum is 150. The higher score obtained from this questionnaire indicates more satisfaction with the quality of work life. Also, the score of work life quality was classified in three levels of less than 90 as unfavorable, 120-90 as relatively favorable and more than 120 as favorable. The validity of these questionnaires was certified by 10 expert professors of Mashhad University of Medical Sciences. The reliability of the questionnaire of work life quality has been calculated by the port and colleagues test-retest method and its internal consistency, and Alpha Cronbach correlation coefficient was obtained as 0/7 and 0/88 respectively. In this study, the reliability of this questionnaire was evaluated in the internal consistency method in that the Cronbach alpha coefficient was 0/81. Data collection was conducted in both groups simultaneously in three stages, before the intervention, the end of the second session and one month after intervention. After the adoption of the University Research Council and approval by the ethics committee, the intervention was held according to "stress inoculation" stages by a researcher and clinical psychologist cooperation through group discussion and mental imagery for intervention group during two sessions (each session lasting 4 hours) within a week time pace of each other. The first session included an explanation about the nature and consequences of stress, identifying common coping skills among the participants and relaxation training. At the end of the first session, participants were given practical

assignments to do during the week and recorded the stressful factors if encountered during the week, also practice relaxation technique daily. In the second session, time management and cognitive restructuring techniques were taught to the participants. Then, using mental imagery, the participants were confronted with stressful factor. Research units were followed for one month after the intervention. During this time, the researchers also contacted with the participants of the intervention group by telephone once every two weeks were and carried out necessary strengthening and Follow-up in relation to following the training program. In order to comply with ethical considerations and take advantage of the content of the workshop and the privilege of re-education by the control group, inoculation program was also performed for the control group two months after the end of the study in the same manner for the intervention group.

SPSS software version 11.5 was used to analyze the data. The results of Kolmogorov - Smirnov and Shapiro Wilke tests showed that quantitative variables in this study had normal distribution; to describe demographic information and personal characteristics, the mean, standard deviation, and frequency distribution table (relative, absolute) were used. To study the homogeneity of the two groups in terms of qualitative variables, chi-square and independent T tests were used. Pre- and post-intervention of control and test group (intergroup) in terms of work life quality was carried out using test of variance analysis with repeated measures and the quality of work life between the two groups was compared by independent T test. The relationship between the impact of inoculation program on the quality of work life and personal characteristics was performed using bilateral variance analysis test. In the tests conducted, the confidence coefficient and significance level were considered as 95 percent $\alpha = 0.05$ respectively.

RESULTS

The majority of research units in both groups (50% in the intervention group and 73/31% in the control group) were male and their mean age was 36 years. The research units in both inoculation and the control group were married. 96/71% of the research units in each group had a bachelor's degree. The average work experience of participants in the psych wards was 90/9 years. In terms of employment status, the majority of research units in both groups (61/58% in inoculation and 32/63% in the control group) were contract employed. In terms of all field variables, there was no significant difference between the two groups and they were homogeneous [Table 1].

Table 1: Compare the Background variables in the intervention and control groups

Background variables	Groups		Test result	
	control	intervention		
	number (percentage)	number (percentage)		
Gender	22 (73.3)	15 (50)	male	Chi-square 0.63
	8 (26.7)	15 (50)	female	
Age (mean \pm standard deviation)	6.42 \pm 35.41	7.65 \pm 36.50		independent T 0.567
marital status	4 (12.33)	3 (10.0)	single	Chi-square 0.688
	26 (86.7)	27 (90.0)	married	
Employment Status	12 (43.3)	11 (36.7)	Official	Chi-square 0.713
	18 (56.7)	19 (63.3)	Contractual	
Work experience in psych ward (mean \pm standard deviation)	5.21 \pm 4.65	7.12 \pm 6.61		independent T 0.816

In terms of work life quality at the stage before intervention, there was no statistically significant difference between the two groups and both groups were homogenous in this respect. This average got increased by a rate of 6/7 score (5/6%) in the inoculation group at pos-intervention stage and by the rate of 8/3 score (6/9%) at follow-up stage one month later. As well, in the control group, the average score of work life quality decreased from 83/41 \pm 11/31 score before intervention to 83/40 \pm 11/50 score after the intervention and 82/72 \pm 10/91 score in the fellow-up stage of one-month later. Independent t-test results (comparison between groups) showed that the score of work life quality in the intervention group had increased significantly compared to the control group after the intervention stage ($p = 0.002$), as well as the stage of follow-up one month later ($p = 0.000$). Also comparison of the mean score of work life quality in the stages before and after intervention and follow-up one month later in the inoculation group (within group comparison) by variance analysis test and with repeated measures showed that there is a significant difference between the three stages ($p = 0.000$). The same test showed the difference between pre-intervention and post-intervention stages as ($p = 0.000$), between post-intervention and one month after the intervention as ($p = 0.000$) and also between pre-intervention and follow-up one month later

stage as ($p= 0.000$) that had an upward movement. In the control group, the results of variance analysis test with repeated measures (within group comparison) also showed that the average score of work life quality in the stages before and after intervention and follow-up one month later, has a significant difference ($p= 0.000$). The same test showed this difference between post-intervention and follow-up one month later stages as ($p = 0.000$), between pre-intervention and one month after the intervention as ($p= 0.000$) that had a downward movement [Table 2].

In terms of life quality levels, 26/7% group members of inoculation program in the pre-intervention, 36/7% in post-intervention and follow-up one month after intervention stages had a relatively good life quality. Also, 23/3% members of control group in the pre-intervention and post-intervention stages, 20/7% in follow-up one month later stage had a relatively good life quality. None of the subjects participating in this study were at the optimum level in terms of work life quality.

Bilateral ANOVA statistical test results showed that none of the background variables studied had significant effect on variation in quality score of work life in the pre-test and follow-up a month later stages.

Table 2: Compare the mean score of work life quality of nurses in psych ward, studied in the stress inoculation program and control groups, at the stages pre-intervention, post-intervention, and follow-up one month later

P-Value [#]	Group						Stage			
	Total			Inoculation program				control		
	number	mean	± standard deviation	number	mean	± standard deviation	number	mean	± standard deviation	
0.359	60	12.6	±81.7	30	13.8	±80.0	30	11.3	±83.4	pre-intervention
*0.002	60	15.3	±85.1	30	18.7	±86.7	30	11.0	±83.3	post-intervention
*0.000	60	14.8	±85.5	30	17.6	±88.3	30	10.9	±82.7	follow-up one month later
				0.000=p			0.000=p			Test result Repeated Measures

#: Independent t-test*: $p<0.05$ was considered significant.

DISCUSSION

Findings of this research showed that the average of work life quality in the intervention group increased significantly after intervention and these changes was preserved till after one month. This indicates the impact of stress inoculation program on the work life quality of nurses in psych wards. Given that, despite an extensive search, no studies were found that have measured the impact of the inoculation program or other stress management techniques on the work life quality, the findings of this study were compared with the studies which have measured other interventions on the quality of work life or the effect of stress management interventions on quality of life. The study findings by Dargahi and colleagues (2006) showed that one of the factors affecting the work life quality of nurses is occupational stress and lack of transparency about their job prospect [22]. In this study, the implementation of stress inoculation program also helped increase the work life quality of nurses. Stress inoculation program has a flexible and proactive approach. In this program, patients are taught coping skills and the duration and mode of implementation of the program would vary based on positioning and living condition of individuals. The program teaches the person how to prevent from exposure to stressful conditions as a result of his interaction with the environment by controlling his emotions, behavior, and performance [21].

Results of the study by Hamidi et al (2013) also showed that the work life quality and perceived stress have a negative relationship with each other, that's quality of working life comes down by increasing the perceived stress, and reduction of the level of perceived stress increases the quality of working life and this is consistent with the findings of our study [23]. Konnert and et al (2009) also suggest that the implementation of cognitive-behavioral group therapy among nurses is cost effective and stress coping program, decrease in negative thoughts and increase in happy and breezy events caused a significant improvement in the group of nurses who were exposed to these programs [24]. Stressinoculation program will not only help the person deal with the problems and stressors advantageously, but also have a more positive cognitive assessment of themselves due to successful behave in dealing with these factors, and will consequently experience more positive excitements and affections and their self-confidence will increase [25]. In the study by Elizur titled as "work life quality and its relation to life quality", the systematic investigation of these two concepts showed that psychological factors such as perceived stress of individuals influence on their coherent and adaptive performance and ultimately affect their quality of work life and quality of life [26]. Since one of the causes of stress is the assessment of situations as threatening that is caused by the person's negative automatic thoughts, stress inoculation pattern by identifying and challenging negative automatic thoughts, provides an opportunity for the individual to re-evaluate these thoughts and be able to change them [26].

In the research by Khaghanizade and colleagues (1387) titled as "study the relationship between job stress and work life quality among nurses", it was found that nurses with high QWL have less job stress [27]. A study was conducted by Yamazaki and Takeuchi titled as the relationship between work-family conflict and positive perception of the content (a type of stress management) in Japan. This study was performed as a self-executive questionnaire among 388 female Japanese nurses working in three hospitals in Tokyo. Based on the findings of this study, one of the most important variables affecting nurses' work-life conflicts is one's ability to cope with stress [28]. By learning stress inoculation training methods, the individual's ability to deal effectively with incidents increases and encouraging the person to use these methods in everyday life would lead to receive positive feedback in him; this reduces the individual's avoid from situations and he feels more control over the environment [29].

The findings of this study are not consistent with the results of the research by Dehghan Niri and colleagues who measured the effect of body relaxation on stress and life quality of the students inhabiting in student dormitories [30]. This difference is probably due to differences in the type of intervention, different work and life situations of nurses with those of students as well as their differences in the perception and expectations of life quality. Due to the different situations, factors affecting the relationship between stress and life quality of nurses and students have been different which have also affected final results as well. The study of Dehghan Niri and colleagues has been conducted at the end of semester during which the mental stress caused by exams and assignments of the semester end has caused that relaxation alone cannot significantly improve their life quality. In the current study, at the followed-up a month later stage as well, work life quality of the intervention group has significantly improved compared to pre-intervention stage as well as post-intervention stage; And it could be due to repetitive and optimal use of inoculation program by nurses during the course of pursuing in their daily functioning, as well as changing the quality of working life with the passage of time.

Field variables examined in this study have not significantly affected the quality of work life. Of course lack of revealing a significant relationship does not mean lack of real relationship; because the sample size of this study was not set to evaluate this relationship and investigating these relationships requires greater sample size.

This study had limitations of which the most important are: 1. because all subjects were selected from the hospital and the sample size was small the results of this study are only applicable to the same environment. 2. Individual differences of nurses in perception of the experiences and aspects of life quality and the groups were attempted to be relatively homogeneous by random allocation of intervention and control groups from this point of view; 3. Lack of full control over the exchange of information between the intervention and control groups that the test group was also asked to refrain from disseminating information by the end of the study for reducing the dissemination of information; The control group was also assured about holding workshops of stress inoculation program after the intervention, and the exchange of information was controlled as possible by this way.

CONCLUSION

Paying attention to the quality of work life and emphasis on ways which enhance the quality of work life increase nurses' job satisfaction and productivity and as a result their participation and satisfaction of working becomes more and the stress of work gets reduced.

Given that the findings of this study showed that conducting Stress Inoculation Program makes the nurses' work life quality increase, this method can be used as an effective and practical strategy for better and more healthy stress management and promoting the nurses' work life quality so that so that thereby, both quality of nursing services enhance and patients satisfaction increases.

CONFLICT OF INTEREST

Authors declare no conflict of interest.

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