

## ARTICLE

# E-LEARNING OR IN-PERSON APPROACHES IN CONTINUOUS MEDICAL EDUCATION: A COMPARATIVE STUDY

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## ABSTRACT

**Introduction:** Technological advancement and new discoveries in science has made it practically impossible to deny the need for revolutions in the process of conducting training activities. E-learning is a method of facilitating and promoting learning through the use of information and communication technology tools. The aim of this study is to compare the knowledge of general practitioners participating in addiction detoxification continuous training program employing electronic (offline) and in-person training. **Method:** This quasi-experimental study was conducted in 2013 in Fars Province, Iran by psychiatrists who participated in the addiction detoxification continuous training program. A total of 118 samples were randomly divided into two equal groups of 59 subjects after completion of the pre-test questionnaire. The in-person retraining method was employed in one group while the electronic learning method was employed in the other group. A posttest was administered after the training. Data was collected with the aid of a written test; the validity and reliability of the questions were determined by 5 members of the medical faculty and Cronbach's alpha of 85%, respectively. Statistical analysis of data was carried out using SPSS (ver.16), t-test and Levene's test. **Results:** The results revealed that there was a significant difference between the pretest and posttest scores, and the posttest scores obtained in the e-learning group were significantly higher than the pretest scores ( $p < 0.01$ ). **Conclusion:** E-learning method can be employed as an alternative or complement to traditional training in the retraining of practitioners. This method makes it possible for instructors to benefit from several training strategies and foster active learning in students.

## INTRODUCTION

In the present era, training, which is considered as a basic human right is known to be a factor of change and social progress. Many psychologists undergoing training believe that learning conditions must be organized in a way that will enable each learner to achieve optimal learning capacity. E-learning technology has paved the way for many training aspirations, such as independent learning, self-directed learning, learning in any place, special time-independent learning, collaborative training and learning and rapid feedback and evaluation of learning to appear more attainable [2]. Continuous training is one of the areas in which e-learning has been hugely applied. The term "continuous training" refers to postgraduate activities designed to promote knowledge, skills and professional competence. Continuous training of the health team is a key element in bolstering the quality and efficacy of the healthcare system. Taking into cognizance the fact that subjects of continuous medical training have access to experimental teaching methods, they are considered the best group to benefit from remote learning through the use of information technology and network utilization. Based on the foregoing, practitioners need to adopt methods that will enable them to utilize their knowledge and enhance their performance without time and place constraints [3, 4]. Although, conventional continuous medical training courses increase participants' knowledge, it has little effect on the behavior of practitioners and capable of improving the patients' confidence on the practitioner [6, 5]. In a study titled "Comparison of the Effectiveness of Web-based and In-person Class Methods", Schrader (2006) showed that e-learning is 6% more effective than in-person training method in providing knowledge; although, students' learning was reported to be identical in both methods and students were satisfied with both methods. However, in longitudinal studies conducted in comparison with the control group, web-based training, which was accompanied with feedback from the instructors, was 19% more efficacious than the in-person training method [7]. Moazemi (2014) conducted a research on dental students to compare the traditional and electronic methods and concluded that the e-learning method significantly increased knowledge and skills of participants [8]. Overall, the research results indicated that e-learning is an effective method of learning. Taking into cognizance the fact that subjects of continuous medical training have access to experimental teaching methods, they are considered the best group to benefit from remote learning using information technology and network utilization. Addiction detoxification training is a priority for the Ministry of Health and healthcare workers. Addiction to drugs and psychotropic after road traffic accidents, injuries and accidents, cardiovascular diseases and depression is in the 4th place of the diseases' burden classification. Among the 18-30 year old male population, addiction was classified in the second place of disease burden. Iran's Forensic Medicine report in 2013 revealed that 8 people lose their lives every day owing to drug addiction. In addition to being associated with mortality and morbidity in the field of health, addiction induces serious family, social and legal consequences for the country [9]. Considering the fact that continuous training centers are responsible for training and updating practitioners' with scientific information such as addiction treatment centers and training of practitioners through in-person and electronic "addiction" detoxification programs, we attempted to evaluate and compare the effects of two training methods.

### KEY WORDS

E-learning, In-person training, Continuous medical training

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## MATERIALS AND METHODS

This research is an applied and quasi-experimental research that examines the level of knowledge and training of general practitioners who participated in the addiction seminar held in 2013 using both in-person and electronic methods. The study population included all practitioners who participated in the addiction detoxification seminar and the total number was 170. The samples were made up of 118 subjects that were identified using Morgan Table (with a population of 170 subjects) and were randomly divided into two equal groups of 59. Inclusion criteria included all practitioners who participated in the addiction detoxification seminar; desire to participate in the research and apathy in participating in addiction retraining courses. Exclusion criteria included unwillingness to continue to cooperate. All samples were randomly divided into two groups after completing the pre-test questionnaire. The in-person retraining method (12h) was used in one group while the electronic learning method was used in the other group. Training content was akin in both groups and was prepared by one of the professors in a related discipline. Given that, most samples were stationed in Fars province, Iran and were engaged in different occupations, offline method was employed in the e-learning group to present the content in such a way that flexibility of time, place and speed of learning will be accommodated. The designing stage of the offline content got underway after receiving related training contents relative to the standards of e-learning.

The training content was initially segmented and thereafter, it was designed in the interactive multimedia form (a professor's voice, related images and animations, clinical specimens) with self-assessment training at the end of each segment. All steps were designed in collaboration with instructional design experts and e-learning specialists in the e-learning hub. After the evaluation process, amendment and approval of the person in charge, the content was made available on compact disc to the research subjects. The subjects after studying the interactive content and passing all sections of the course proceeded to the posttest section of the compact disc. After answering the questions, the learners received a code that specified the number and score of their medical system and their score was determined in the continuous training by furnishing this code to the concerned authorities (researcher). In the in-person training, the professor taught lessons using lectures and PowerPoint presentations along with questions and answers. Thereafter, the participants completed the posttest questionnaire. The data collection tool was a written exam, in which test questions on the continuous addiction detoxification training program was designed and developed based on the content of the lessons taught by the professor and consisted of 24 multiple choice questions (closed and regular questions). Face and content validity of the test questions were evaluated by five faculty specialists at Shiraz University of Medical Sciences and their comments were applied. The reliability of the questionnaires was 85%, which was determined by distributing the questionnaires among 15 physicians using Cronbach's alpha. Participants in both groups (in-person and electronic training) answered questions by stating their area of specializations on two occasions before and after training. In order to confirm laws and ethical standards, the objectives of the study was explained to the participants and they were assured that all information will be kept confidential. Statistical analysis of data was carried out using SPSS software (ver.16), t-test and Levene's test. A 0.05 significance level was considered in this study.

## RESULTS

The study was conducted to compare the effects of continuous training addiction detoxification programs using both in-person and e-learning methods on general practitioners' knowledge in Fars Province. Male and female participants accounted for 89.4% and 10.6% of the subjects. In addition, managers of private and government research addiction detoxification centers accounted for 89.8% and 10.2% of the subjects, respectively. In order to test the first hypothesis of the research (general practitioners' knowledge level before in-person and electronic training on addiction detoxification reeducation was different), the independent samples t-test was employed [Table 1].

**Table 1:** Comparison of general practitioner's knowledge level before in-person and electronic training on addiction detoxification reeducation

Learning Method	Number	Average	Standard Deviation	t value	Degree of Freedom	Significance Level
Pre-test	In-person training	59	13.25	0.31	116	0.31
	E-learning	59	13.15			

The results in [Table 1] show that the average pre-test score in the in-person training (13.25%) is more than that of the average pre-test score in the electronic training (13.15%). The independent t-test was used to compare the average in-person and electronic teaching methods as well as investigation of the first hypothesis. As can be seen, the calculated t value was 0.31, which was not significant at 0.05. In other words, there was no statistically significant difference between the pre-test in the in-person and

electronic training groups. To investigate the second hypothesis of the research (general practitioners' knowledge level before and after in-person and electronic training on addiction detoxification reeducation was different), t-test was used and the results are presented in [Table 2].

**Table 2:** Comparison of general practitioner's knowledge level before in-person training on addiction detoxification reeducation

Learning Method	Number	Average	Standard Deviation	t value	Degrees of Freedom	Significance Level
Pre-test	59	13.25	1.87	11.16	116	0.001
In-person training						
Post-test	59	17.06	1.83			

The results of the above [Table 2] show that the average pre-test score in the in-person training (13.25%) is less than that of the average posttest score in the in-person training (17.06%). In order to compare the average pre-test and posttest score, the dependent t-test was used. As can be seen, the calculated t value was 11.62%, which was significant at 0.001; i.e. the level of knowledge of general practitioners who were trained using in-person method increased. To investigate third hypothesis of the research (general practitioners' knowledge level before and after electronic training on addiction detoxification reeducation was different), t-test was used and the results are presented in [Table 3].

**Table 3:** Comparison of general practitioner's knowledge level before electronic training on addiction detoxification reeducation

Learning Method	Number	Average	Standard Deviation	t value	Degrees of Freedom	Significance Level
Pre-test	59	13.15	1.62	19.06	116	0.001
E-learning						
Post-test	59	18.84	1.61			

The results of the above [Table 3] show that the average pre-test score in the electronic training method (13.15%) is less than that of the average posttest score in electronic training method (18.84%). In order to compare the average pre-test and posttest score, the t-test was used. As can be seen, the calculated t value was 19.06%, which was significant at 0.001; i.e. the level of knowledge of general practitioners trained using electronic training method increased. To investigate the main hypothesis of the research (general practitioners' knowledge level after in-person and electronic training on addiction detoxification reeducation was different), the independent t-test was used and the results are presented in [Table 4].

**Table 4:** Comparison of general practitioner's knowledge level after in-person and electronic training on addiction detoxification reeducation

Learning Method	Number	Average	Standard Deviation	t value	Degrees of Freedom	Significance Level
In-person training	59	17.06	1.83	5.58	116	0.001
Post-test						
E-learning	59	18.84	1.61			

The results of the above [Table 4] show that the average posttest score in the in-person training method (17.06%) is less than that of the average posttest score in electronic training method (18.84%). In order to compare the average posttest score of both groups, the independent t-test was used. The results show that the calculated t value was 5.58%, which was significant at 0.001; i.e. electronic training method increased the level of knowledge of general practitioners the more compared to the in-person training method.

## DISCUSSION AND CONCLUSION

The aim of this study was to compare the level of knowledge of practitioners participating in addiction detoxification reeducation courses using electronic and in-person training methods. Overall, the results showed that e-learning method as compared to the in-person learning method significantly increased general practitioners' level of knowledge ( $p < 0.001$ ). The results of this study are in consonance with the results of other researchers. For example, Khatooni's study showed that the internet like the traditional training methods could be used effectively to provide continuous training programs [10], [11]. Yasin et al. showed that web-based training, which is accompanied with a positive feedback from the instructor, is far more efficacious than the in-person training method. Other studies have also shown the positive effect of electronic training on anatomy and oral health training [12, 13]. Moreover, the results

indicated an increase in knowledge of general practitioners who were trained using the in-person training method ( $p < 0.001$ ). The results of the present research are in consonance with the results of researches carried out by Student, Samad and Fani [14,15, 16], but was not in consonance with the results of Basra on, Mohammad Jafari, Moatari and Moradi [17,18,19]. These researchers believed that continuous in-person training programs failed to increase the knowledge of participants in the acceptable range. Overall, the results of this study indicated that in-person training methods are relatively effective, but achieved little success in attaining the objectives of the program as well as the expected return. It seems that programs that incorporate active learning and problem-oriented methods are interactional by nature and involves more people than other methods such as electronically designed methods, which are significantly more effective than the lecturing method and has increased the efficacy of many programs. The results of previous researches and the results of the current e-learning research programs could be used as a replacement for in-person training programs. In most cases, the e-learning programs were more effective and successful than the in-person training programs and helped researchers to achieve the desired goals. E-learning provides a lot of information from a variety of sources and increase access to knowledge on a continuous basis. It also enhances the quality of services and adapts quickly to new programs and information. The interactive feature of electronic continuous medical training courses along with its flexibility in time and space, improves the efficiency and functionality of addiction detoxification courses more than the traditional methods. One of the constraints of traditional continuous medical training courses is place and time restriction, which has been eliminated in the electronic courses. On the other hand, electronic medical continuous training courses are more attractive not only because they are accessible at any time and place, but because interaction and engagement have also been given special consideration in e-learning. Finally, considering the results obtained in the present study, it is recommended that new training approaches should be considered using information and communication technology in order to enhance continuous medical training.

#### CONFLICT OF INTEREST

There is no conflict of interest.

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#### FINANCIAL DISCLOSURE

None

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