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Comparison of the effect of electronic education and workshop on the satisfaction of nurses about Emergency Severity Index triage

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Abstract:

INTRODUCTION: Nurse educators need to develop the level of scientific and practical of the students with the goal of becoming expert nurses. However, the use of modern educational methods to raise the motivation and satisfaction of learners can help individuals achieve this goal. Therefore, the aim of this study was to investigate the effect of health education in emergency nurses about triage.

METHODS: A two-group pool-blind experimental study was performed on seventy emergency nurses. Samples were randomly assigned into two groups: e-learning group (35 individuals = electronic education) and traditional group (35 = workshop education). The demographic questionnaire and the satisfaction questionnaire before and 2 weeks after the intervention in both groups were completed.

RESULTS: Independent *t*-test showed that the satisfaction scores before intervention in both e-learning and traditional groups were not statistically significant, whereas there was a significant difference between two groups after 2 weeks after the intervention ($P = 0/015$).

CONCLUSION: Using nursing professors' electronic education programs can increase the level of satisfaction and motivation in the nursing mothers. Therefore, the use of this new educational method is recommended by managers and educational planners as an effective teaching.

Keywords:

Education, health, nurses, triage

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Introduction

In medical emergencies, seconds and minutes are important to the patient, and these time measurements may determine the interval between death and serious disability or prosperous life.^[1-3] In this context, one of the aspects of emergency care that is as valuable as the ability of the emergency department in the evaluation, treatment, and determining the fate of a patient is the use of an effective and appropriate triage system.^[4] Triage is derived from the French term *Trier* meaning selection or classification, the purpose of which is to leverage the care provided to

patients in need of medical care due to a lack of needed resources.^[5-7] In 1998, for the first time in the United States, triage was introduced as a response to the problem of crowding the emergency department of hospitals^[7] that provided primary medical care when physicians' offices were closed.

In Iran, despite the newly introduced idea of hospital triage, most hospital emergency departments in the country have this unit in their structure. There are various hospital triages around the world that sort patients at five levels of priority including the Manchester, Canadian, and Australian triages. These systems identify patients based on the presence

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or absence of life-threatening factors and the severity of the disease, in five levels as immediate action (red), urgent (orange), delayed (yellow), standard (green), and nonurgent (blue).^[6] Among these, one of the applied five-level triage systems according to the Ministry of Health in Iran is the Emergency Severity Index (ESI) triage.^[8] In this method, the triage nurse prioritizes the patient based on two criteria such as severity of illness and the needed facilities. The first one is determined based on the presence of life-threatening factors, risk factors, as well as the vital signs, and the second one is determined on the basis of experience of the nurse. Moreover, determining the patients' diagnostic and therapeutic resource requirements by nurses distinguishes this system from other triage systems.^[9,10]

Therefore, like other triage systems, implementation of this triage system requires adequate levels of training and support.^[11,12] Without proper training, nurses will not be able to practice triage correctly and in accordance with the standards provided.^[13] As inaccurate classification of patients at lower triage levels exposes patients awaiting handling and treatment to serious risks, inaccurate patient placement at higher triage levels also has other consequences, such as the use of scarce financial and human resources in hospitals.^[14]

Undoubtedly, the nurses taking professional actions including triage of patients, play an important role in the duration of patients' stay in the emergency department and can be effective in reducing this time.^[15] Hence, training triage has also been taken into consideration in hospitals along with implementing any type of triage system.^[16] On the other hand, to achieve the education goals and to enhance the learners' knowledge, the attention of instructors to the satisfaction of learners in curriculum planning will be important and helpful in selecting the teaching method.

In fact, education is effective when learners are satisfied with the teaching method and have an active participation in the teaching process. In addition, choosing the right teaching method plays an important role in satisfaction and emphasizes the importance of choosing the right teaching method for the instructors. In fact, education is effective when learners are satisfied with the teaching method. In recent years, the educational systems have felt the need to rethink the teaching methods and the use of new and active methods of learning, whereas the conventional teaching method at universities is still teacher-centered. One of the new teaching approaches is the use of electronic method.^[17-19]

By identifying factors affecting satisfaction, researchers report that the best alternative to traditional (face-to-face) education is the use of new information technologies (ITs)

in education. One aspect of IT in the medical field is the use of e-learning or online training. Around the world, this training method has experienced a rapid growth rate of 35.6%. In an e-learning environment, many factors influence satisfaction. In most studies, these factors have been categorized into six categories: learner, educator, curriculum, technology, design, and environment.^[20,21] Nasr Esfahani in his research showed that factors including computer use, teacher's attitude, flexibility, learning method, quality of methods, perceived benefit and ease, and assessment variation accounted for 61.1% of the total variance of e-learner satisfaction.^[22] Overall, according to the above argument, satisfaction in the education sector reflects the effectiveness of all areas of education, both scientifically and practically.^[23]

Traditional teaching method like training large and diverse numbers of staff is time-consuming, costly, and difficult. In contrast, in e-learning, learners have access to courses 24 h a day, they learn at their own pace, the need to commute to classes is eliminated, there is no interference in the staff's work schedule, and the time required for learning is reduced by 25%–30%.^[24] It is also important to note that determining students' satisfaction with education has always been a parameter for measuring the effectiveness of educational systems. Furthermore, creating satisfaction in learners as the main target audience of education is one of the most important factors in the success of educational courses.^[25] In this regard, Jeffries *et al.* showed in their study that satisfaction post test scores was better in both traditional and e-learning groups compared to pretest. Furthermore, the participants' satisfaction level in both groups was medium to high.^[25] However, the results of the study by Keulers *et al.* showed that the mean level of satisfaction was similar in face-to-face and software groups, and there was no statistically significant difference between them.^[26] totally, considering the benefits of e-learning and the emerging triage system in Iran, and since there has been no study on ESI method of triage training in Iran so far, and that the triage training for nurses in the emergency departments with the most efficient methods seems to be essential and also contradictory results in this field, the purpose of this study is to compare the effect of electronic education and workshop on the satisfaction of nurses about ESI triage.

Materials and Methods

An experimental and educational intervention was performed on seventy ED nurses working in hospitals affiliated with Isfahan University of Medical Sciences (IUMS) in 2014. The sample size was calculated as 35 participants in each group (a total of seventy participants) by the use of mean comparison formula.

$$n = \frac{Z^2 P(1-P)}{d^2}$$
 (n = sample volume, Z = confidence level, P = expected prevalence, d = accuracy). The inclusion criteria were as follows: having a phone number to contact and having a computer, mobile, or a video CD at home and being able to use them. Furthermore, the exclusion criteria of the study included attending classes related to the teaching of triage during the study and failure to participate in one of the stages of the test.

The method of sampling was two steps. In the first step, two hospitals were randomly selected from five hospitals affiliated with IUMS using a random number table, such that the workshop method was assigned to the first hospital and electronic learning to the second hospital. Furthermore, in the second step, through census method and based on the list of nursing in the emergency department, trainings related to workshops and electronic learning were assigned for all of emergency nurses to each group.

In the e-learning group, software was given to them. The program contained ESI triage education through text, pictures, animation, and sound, as well as a slideshow. This 45-min software contained ESI triage education. Educational content was in the type of a web page or Flash Video, Windows Media Video, and MPEG-4 (MP4), as these formats can be used in a closed-line web. After the explanation was given to the nurses as to how to use the software, they were informed that they would be asked some related questions 2 weeks later.

Like the e-learning group, the nurses participated in the workshop for 2 h. In this method, the training related to ESI triage was presented by the emergency medicine faculty member of IUMS to the participants in the form of holding a workshop. Before performing both educational interventions, the demographic questionnaire and the satisfaction questionnaire about the type of trainings were completed for both groups. In addition, 2 weeks after the intervention, the satisfaction questionnaire was collected again in both groups.

The instrument used in the study consisted of two parts. The first part included eight questions on demographic data including the participants' age, gender, educational level, and the source of ESI triage education. The second part of the instrument included the satisfaction questionnaire. The satisfaction questionnaire was designed based on a literature review of valid texts in the form of a researcher-made questionnaire containing 17 questions and a 5-point Likert scale ranging from absolutely satisfied (score 5) to absolutely dissatisfied (score 1). Due to the lack of availability of a standard questionnaire in this field, such a questionnaire was designed through the use of a

country-wide national project, references, and textbooks, and its validity was confirmed by five faculty members of the IUMS. Its reliability was confirmed by the use of a pilot study (conducted on ten nurses) and calculation of Pearson correlation ($r = 0.89$). Data were analyzed by Student's t -test and paired t -test (satisfaction score after and before in each groups) through version 11.5 SPSS Inc., Chicago, IL, USA with a significance level of $P < 0.05$.

Ethical considerations

The study protocol and its ethical considerations were approved by the applied research council and ethics committee of IUMS (grant no. 294083; ethical approval was issued on November 23, 2014). Permission was obtained from the hospital authorities, and the purpose of the study was explained to all participants, and they all signed the written informed consents before participation. They were also assured of the data confidentiality, and all the questionnaires were kept anonymous.

Results

In this study, 63% were females, 57% were single, and 80% had a bachelor in nursing [Table 1]. most sources of information for learning about triage were as follows: continuing education (49%) and book [Figure 1]. Furthermore, independent t -test showed that there was no significant difference in mean total age ($P = 0.23$), working experience ($P = 0.12$), and working hours of the nurses ($P = 0.41$), before the study between the two groups, that means, the two groups were homogeneous. Furthermore, the independent t -test shows that the mean scores of satisfaction increased significantly after the intervention compared to the scores before intervention in both e-learning and traditional groups. Furthermore, pair t -test showed that there was a significant difference between two groups [Table 2].

Discussion

Learning satisfaction is one of the most important factors in the learning process of modern teaching methods.^[26,27]

Table 1: The demographic characteristics of emergency nurses participated in the study

Variables	n (%)
Gender	
Male	45 (63)
Female	25 (37)
Marriage	
Single	40 (57)
Married	30 (43)
Education	
Bachelor of nurse	56 (80)
Master of nurse and more	14 (20)

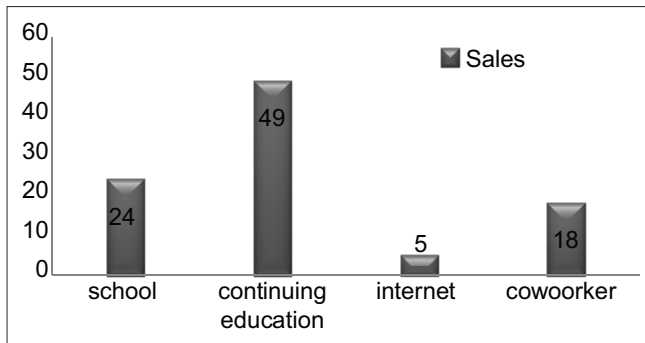


Figure 1: Frequency distribution of participants based on the source of obtained information

Table 2: Comparison of mean scores of nurse’s satisfaction with emergency severity index triage education before and 2 weeks after intervention in two groups

Satisfaction	Educational group, mean±SD		T-test results (P)
	Electronics	Workshop	
Before intervention	24.50±0.011	23.01±2.11	0.19
2 weeks after intervention	68.23± 3.11	49.18±3.24	0.023
Paired t-test results (P)	0.03	0.021	

SD=Standard deviation

Today, e-learning focuses solely on the learners and enhances their learning quality. Satisfaction of nurses improves their motivation and increases their level of learning. The results of the present study showed that in general, satisfaction is increased after both educational methods and is significant compared to the beginning of the study, but this increase is more in e-learning group. Zolfaghari *et al.* showed in their study that using virtual learning methods considering appropriate interactive environments and making virtual environments attractive to learners would encourage learning.^[28]

However, kuhpayehzadeh *et al.*'s (2016) study, which compared virtual and traditional teaching methods in theoretical community-based dentistry teaching, on seventy Ph. D. students at Shahid Beheshti Dentistry College, showed a high and similar mean score of satisfaction in both traditional and e-learning groups with no overall significant difference.^[29] Hale *et al.* at Wichita State University estimated that the average satisfaction in both groups was similar.^[30] Reime *et al.* found that satisfaction with the virtual method was similar to the traditional method, and students were satisfied with both methods.^[31]

With the introduction of World Wide Web innovation, the next generation of computer-based and mobile learning, for example, e-learning, was at the disposal of the organizations. Advantages such as accessibility at any time and any place, reduced training costs, and flexibility and the ability to align it with job responsibilities, along

with effective and satisfying training, have attracted the attention of many organizations to e-learning.^[32,33] In this respect, a study showed that the success of an e-learning program depends to a large extent on the satisfaction of learners. This means that learners who are satisfied with the e-learning training program will most likely benefit from the educational courses of that system.^[34,35]

The main feature of e-learning is the ease of communication, interaction, and easy access to information. In fact, the main purpose of e-learning is to embrace the diversity of teaching resources and teaching methods, while being integrated to achieve effective learning of the learner. E-learning can be considered as a flexible, comprehensive, and inclusive approach to education that enables the learning process using IT tools such that the learners can choose the time and place of learning and the desired format and teaching tool tailored to their particular needs and circumstances and can self-educate more quickly and easily.^[36]

Despite the huge investment made in developing e-learning systems, if users do not use the system, the investment would be wasted and rendered useless, so it is important to know the factors affecting the learner’s satisfaction with these systems. E-learning is, therefore, one of the most prominent learning environments in the information age. By identifying factors affecting satisfaction, researchers report that e-learning is the best alternative to traditional (face-to-face) education.^[20-37] Given that triage decision for patients in the emergency department is the first and most essential step for the next stages of treatment, and triage designation nurses need to be well educated, it seems that triage training through an electronic system – due to availability and lack of problems of traditional education – increases the efficiency and satisfaction of nurses.

It is worth noting that the present study had some limitations like any study, such as the slow Internet speed and the failure of learners to download many training programs. This problem was partially controlled by providing electronic files of training and making phone calls to all learners to use the content. Other limitations of the study include the difficulty of having access to nurses participating in the study to complete the questionnaire, and with regard to rotating work shifts of the nurses, it was attempted to fill the questionnaire by phone call or E-mail.

Conclusion

Triage training in both e-learning and workshop methods increases satisfaction with education, but this increase is more salient in e-learning group. According to the results of this study and considering the high workload,

mental duress and lack of free time of the nurses to attend training classes, using mobile-based training program, can greatly reduce the time and space restrictions and also financial burden of education in this group and increase the satisfaction with training in this group.

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Conflicts of interest

There are no conflicts of interest.

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