

# Assessing the Effect of Triage Education Emergency Severity Index (ESI) In Both Lecturing and Team Base Learning (TBL) On the Knowledge of Emergency Medical Staff Hospitals of Jahrom University of Medical Sciences

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## Abstract

**Introduction:** Triage is the cornerstone of disaster management and its learning is crucial in disaster planning. Utilizing appropriate training method institutionalizes learning and empowers learners. This study investigated the effect of lecture and team-based learning methods on the knowledge of emergency medical staff. **Materials and Methods:** In this clinical trial, using complete enumeration sampling method all the emergency medical staff of Jahrom Hospitals (n= 100) were selected who were randomly allocated into two groups. The intervention included ESI triage training using both lecture and team-based learning methods. A 4-item researcher-made questionnaire with 40 questions was used to measure knowledge. Its validity was confirmed by 10 experts and the Cronbach's alpha coefficient was 0.71 which confirms its reliability. The difficulty and discrimination indices were 43 and 65.7, respectively. **Findings:** There was a significant difference between the mean score of knowledge of medical staff before and after the intervention in both lecture and TBL groups. There was also a significant difference between the two groups after intervention, regarding the mean score of knowledge. **Conclusion:** Both the lecture and TBL interventions enhanced the level of learning; however, higher increase was observed in the TBL group.

**Key words:** ESI, TBL, Lecturing, Emergency medical

## INTRODUCTION

Triage is the cornerstone of disaster management and its learning is very important in disaster planning (1). Studies show that pure knowledge on triage is more important than work experience in triage decision-making (2). Therefore, triage training has always been very important in the emergency departments. In Australia, it is necessary to conduct at least 8 hours of theoretical triage training and 24 hours of practical triage training for patients under the supervision of experienced nurses (3). The Emergency

Severity Index (ESI) is a simple-to-use, five-level triage tool which categorizes emergency department patients by evaluating patient acuity and resources. In this triage, the acuity of patients is determined based on the stability of their vital signs and potential threats to their life, limb or organ (4). The diversity of teaching and learning styles and learning and study views, strategies and methods have significantly attracted the attention of many educational psychologists and educators in recent years (5). In every educational system, it is necessary to create educational changes, including applying new teaching methods tailored to the content of the educational materials to improve the quality of education (6). In clinical training, team-based learning is mostly used in the areas of critical thinking and clinical reasoning (2-5). Team-based learning (TBL) is a learner-center, instructor-led method which is based on the group active learning strategy (7). In team learning, teams can think, create and learn as a single identity (8). By developing coordination in small groups of learners,

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this method improves individual and group skills and accountability (9). Team training was first used in 1994 to provide high levels of education and it was later used by some medical training centers (10). Team training program is based on a theory which says “adult education will be more effective when it is optional, organized, active and operates on the basis of experience and teamwork to solve the current problems of individuals” (11). Team training and learning is an effective way to acquire interpersonal skills which engages learners in the learning process and gives them problem solving and critical thinking skills and solves their learning problems (12). The lecture is a teacher-centered approach (13) which mainly involves oral presentation of materials by the professor or the lecturer (14). This method saves time and resources (15, 16); however, materials are quickly forgotten and there is no time for interaction and participation in learning and this reduces learner motivation (15, 17). Experts believe that the use of active teaching-learning methods will institutionalize learning, increase learning satisfaction and enhance learner capabilities (18) and thus these methods are being used increasingly. However, lecture still remains as the most common teaching method (19). The TBL method has also been used to improve student learning, communication and critical thinking skills, to increase their satisfaction (12), to teach pharmaceutical principles (20) and to enhance the understanding of nursing students (21). Proper implementation of triage is a major task of a medical team at the admission of patients and knowledge is an important element in this regard (22). On the other hand, team learning can improve the learning process and problem comprehension through applying problem solving method, solving learning problems, critical thinking and clinical reasoning (17, 12). Therefore, considering the importance of proper understanding triage principles, as well as the effect of training method on level of learning and understanding of the subject, this study investigated the effect of lecture and team-based learning methods on the knowledge of emergency medical staff.

## MATERIALS AND METHODS

This experimental clinical trial was conducted in Jahrom University of Medical Sciences in 2017. The study population included all medical personnel staff (including nurses and physicians) working in emergency departments of Jahrom hospitals. Using complete enumeration sampling method all the emergency medical staff of Jahrom Hospitals (n= 100) were selected who were randomly allocated into two groups of team-based training (n1= 50) and lecture training (n2= 50).

In the first group, TBL was conducted for one day. First, the purpose and procedures of team-based training and

the principles and objectives of ESI triage were explained. The participants were then divided into 10 groups of 5 people and 35 fictitious scenarios (7 scenarios for each of the five ESI triage stages) were taught using team-based method. Topics were presented in accordance with the team training protocol as follows: A) before the training session, including determining the learning materials and informing learners by an emergency medicine professor, proficient in team teaching method, pre-studying by team members and B) during the training session, including individual readiness assurance test (IRAT), group readiness assurance test (GRAT), appeals process, group assignment and peer feedback and evaluation (12). In the second group, a one-day program was conducted in three sections, including: explaining triage principles, triage history, ESI triage, general principles of ESI triage and its five steps, along with numerous examples and finally solving problems and answering to the questions of participants. A researcher-made triage knowledge questionnaire was used to collect data. This questionnaire contains 40 questions with 4-items which measures ESI triage knowledge. It includes general principles of the five stages of ESI triage and a number of case reports on each of the five stages. Each correct answer is given 0.5 points and the total score is considered as an individual's ESI triage knowledge score. The validity of the questionnaire was measured by 10 emergency and ESI triage experts and it was confirmed after conducting their desired corrections. The mean difficulty and discrimination indices were 43 and 65.7, respectively. The participants in both groups completed the questionnaire before and after the training. Participants in both groups also received certificates and training hours. Descriptive statistics (mean and percentage), independent t-test, paired t-test and repeated measurement were used to analyze data.

## FINDINGS

This clinical trial was conducted in two groups of 50 emergency department personnel. The ESI triage training intervention was conducted using lecture and TBL methods. Tables 1 and 2 compare the two groups in terms of age, gender, academic degree and work experience.

According to the above table, there was no statistically significant difference between the two groups in terms of gender and educational degree.

According to the above table, there was no statistically significant difference between the two groups in terms of age and work experience.

Table 3 compares the mean knowledge score of the lecture group with that of the TBL group, before and after the

**Table 1: Comparison of frequency distribution of nurses in two groups in terms of gender and academic degree**

	Number (percentage)		Chi-square test	
	Lecture	TBL	K2	P value
Gender				
Female	40 (80%)	38 (76%)	0.231	0.631
Male	10 (20%)	12 (24%)		
Academic degree				
Bachelor	43 (86%)	42 (84%)	0.049	0.824
Master	4 (8%)	5 (10%)		
Ph.D.	3 (6%)	3 (6%)		

**Table 2: Comparison of frequency distribution of nurses in two groups in terms of age and work experience**

	Mean (SD)		Independent t-test	
	Lecture	TBL	F	P value
Age	34.02 (5.32)	34.68 (5.22)	0.016	0.898
Work experience	10.34 (4.83)	9.54 (4.59)	0.058	0.811

intervention and Table 4 compares the mean knowledge scores of the lecture and TBL groups, before and after the intervention.

According to the Table 3, there was a statistically significant difference between the two groups in terms of their mean knowledge scores before and after the intervention.

According to the table 4, there was no statistically significant difference between the mean knowledge scores of the two groups before the intervention; however, there was a statistically significant difference between their scores after the intervention.

**DISCUSSION**

In this study, both lecture and TBL methods increased the knowledge of emergency medical staff on ESI triage; however, the increase was significantly higher in the TBL training group.

Based on the findings of the present study, lecture-based training increased the knowledge of individuals. This is consistent with the results of study of Jafari Manesh et al. (2016) (23). In some other studies also lecture-based training had a significant positive effect on learning skills and memory of learners (24, 25). In spite of the emergence of new techniques and development of knowledge, as a teacher-centered approach, lecture is still considered an important (26), safe and easy (27, 28) teaching approach.

**Table 3: Comparison of the mean knowledge score of the lecture group with that of the TBL group before and after the intervention**

	Mean (SD)		Paired t-test	
	Before intervention	After intervention	t	P-value
Lecture	15.48 (2.27)	18.68 (1.69)	-8.19	0.000
TBL	14.42 (2.44)	19.50 (0.73)	-14.10	0.000

**Table 4: Comparison of the mean knowledge score of the lecture and TBL groups before and after the intervention**

	Mean (SD)		Independent t-test	
	Lecture	TBL	F	P-value
Before intervention	15.48 (2.27)	14.42 (2.44)	0.173	0.678
After intervention	18.68 (1.69)	19.50 (0.73)	8.132	0.005

According to the findings of the present study, TBL method was more effective in improving the knowledge of participants, compared to lecture method. Many studies have investigated TBL method (21). Advanced training strategies such as TBL seem to have potential positive effects on learning; because they engage learners in the design, implementation and provision of educational materials (29). In the study of Koohestani and Baghchaghi (2016) using TBL method was more effective than lecture method in promoting understanding of nursing students (21). In the study of Hashmi (2014), using TBL method was more effective than lecture in increasing knowledge on diabetes treatment (30). In addition, in the study of Jafari et al. (2014), TBL method was more effective than lecture in teaching students and led to higher levels of student satisfaction (31). Findings of various studies indicate that using TBL method increases the understanding of learners more than the conventional lectures (21); thus, this method is more popular among medical students, compared to the conventional methods (30). The TBL method with its high potential for creating interactions and improving thorough communication with educators provides the ground for enhancement of communication and interpersonal processes and coordination and professional performance skills in learners (32).

**CONCLUSION**

Although TBL method has not been so far used for triage training; this study showed that it is an effective approach, in this regard. By providing immediate feedback, this method improves one's ability to utilize his knowledge in the clinical decision-making process.

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