

Original research papers

Evaluation of Emergency Nurses' Knowledge and Performance about Hospital Triage

Abstract

Background and Objectives:

By knowing the level of knowledge of triage nurses, we will be capable of making the right decision about allocating suitable resources for enriching the quality of the emergency department. So, the objective of our study is to evaluate triage knowledge and performance of emergency nurses in Yazd province of Iran.

Material and Methods:

This was a cross-sectional study. The sampling was performed from all nurses responsible for triage in emergency departments of 8 educational hospitals of Yazd University of Medical Sciences were included for our sampling in the study. Data collection was done using a questionnaire whose validity and reliability have already been approved. After evaluating all the questionnaires, 84 of them were completed, and others were excluded from the study. Data were analyzed by descriptive and inferential statistics using the SPSS version 22 software.

Results:

According to statistical analysis results, there was no significant relationship between the knowledge score, performance and total score with demographic characteristics. Moreover, there was no significant relationship between educational courses, work experience and work shift with knowledge, performance and total score. Although female nurses' scores in knowledge and performance areas was higher than male scores, the differences were not statistically significant.

Conclusion:

The level of knowledge of the nurses employed in the emergency departments of Shahid Sadoughi University of medical sciences in Yazd is moderate in terms of triage. However, the performance of nurses working in the emergency departments of the aforementioned centers is higher than average. It is concluded that there is an immediate need to reconsider nurses triage education and improve the triage knowledge and performance among nurses.

Keywords: Emergency nurses, Knowledge, Performance, Hospital, Triage.

Introduction

Triage is essential for the first clinical evaluation and categorization of all patients referred to the emergency department to provide the best treatment. Correct and rapid triage of patients is the key to successful performance in the emergency department [1]. The objective of triage is to prioritize patients with a high likelihood of early clinical deterioration. Prehospital clinical course and vital signs, mechanism of injury, patient age, and known or suspected comorbid conditions must be considered in triage of a trauma patient. Some findings such as unstable vital signs, multiple injuries, extremes of age, evidence of severe neurologic injury, and preexisting cardiac or pulmonary disease favor immediate workup [2].

Emergency care begins with triage [3]. Basically, triage decisions light the pathway to whether adequate or inadequate emergency care [4]. The more accurately these decisions are made, the more promising the patients' outcomes will be [5, 6].

The Hospital triage nurses play an important role in triage decision-making since they assess the patient's condition and also determine their priority for admission to the emergency department and for treatment, before anyone else [7]. Obviously, triage knowledge and skill of nurses greatly influences the functional efficiency of emergency department because making the right decision can save the precious time allocated to each patient and more importantly many lives depend on immediate action of medical staff. Moreover, right and timely decision of an experienced nurse can lead to a justifiable distribution of emergency resources to the patients. The significance of a proper distribution of resources becomes tangible in the times of crisis and massive referral to the emergency department [8, 9].

Surprisingly, several studies have declared that nurses' knowledge is not sufficient in terms of triage and many of nurses don't have the required necessary skills. This pitfall in health care system has been reported in Australia [8], in Sweden [10] and in china [11]. Likewise, lack of well-trained triage nurses in many hospitals is major problem in Iran. Several studies have mentioned insufficient triage knowledge and skills among nurses in different provinces of Iran. Reason for which had been identified mainly as defective medical education system that didn't to provide enough information and special courses for nurses [1, 12-14]. The effect of triage education on knowledge of nurses is indisputable [15, 16].

The objective of our study is to evaluate triage knowledge and performance of emergency nurses in Yazd province of Iran. By knowing the level of knowledge of triage nurses, we will be capable of making the right decision about allocating suitable resources for enriching the quality of emergency department. In addition, we aimed to figure out the exact structure and procedures of emergency triage management in times of crisis and in normal conditions.

Material and Methods

This was a cross-sectional study. All nurses responsible for triage in emergency departments of 8 educational hospitals of Yazd University of Medical Sciences were included for our sampling in the study, after evaluating all the questionnaires, 84 of them were completed, and others were excluded from the study. Data collection was done using a questionnaire whose validity and

reliability have already been approved [1]. The questionnaire consisted of three parts. The first part contained 11 questions on demographic information, working conditions and the triage-performing conditions at the relevant center. The second part included 15 questions for assessing the knowledge of nurses through hospital triage. Finally, to assess the performance of the nurses in triage, a test consisting of 10 questions, each suggesting a different scenario for prioritizing patients, was designed and was made available to the respondents. These scenarios have been adjusted by emergency medical experts in the field of triage according to the prevalence of emergency department visits, and its validity and reliability have already been confirmed.

Before the study was begun, the researcher was presented to intended nurses. The goals and methods of conducting the research was explained to nurses and their written consent was obtained for participation in this study. In addition, the nurses were assured that the results would be kept confidential.

Sampling was carried out before or after the work shift so that they couldn't consult their colleagues and cheat at questions. Finally, if the questionnaire was filled out incompletely, the participants were asked to complete the forgotten information.

Considering that the evaluation of nurses' proficiency by real and practical tests could jeopardize their clinical performance, therefore, the written test was utilized due to issues. The score range of the knowledge assessment section was from 0 to 15, and for the performance evaluation section from 0 to 10. Thus, the total score would range from 0 to 25.

Statistical analysis

Data were analyzed by descriptive and inferential statistics using the SPSS version 22 software. To compare the scores of knowledge, performance and total score between categorized groups, independent t-test and One-way ANOVA was used. P value less than 0.05 was assumed as significance level.

Results

56.8% of participants were men with mean age of 34.8 ± 6.6 years and 43.2% (36 cases) were women with an average age of 31.8 ± 4.4 years. Normality of the data was checked using the Kolmogorov-Smirnov test which indicated that the data had a normal distribution. According to statistical analysis results, there was no significant relationship between the knowledge score, performance and total score with demographic characteristics. Moreover, there was no significant relationship between educations, work experience and work shift with knowledge, performance and total score.

The results of the second part of the questionnaire (knowledge) showed that the average score of the samples was 6 ± 1.9 . Additionally, the results of nurses' performance test demonstrated that the mean scores obtained were 6 ± 2 . The total score regarding knowledge and performance tests together was 12 ± 3.4

Although female nurses' scores in knowledge and performance areas was higher than male scores, the differences were not statistically significant. The level of knowledge of the nurses

employed in the emergency departments of Shahid Sadoughi University of medical sciences in Yazd is moderate in terms of triage. However, the **performance** of nurses working in the emergency departments of the aforementioned centers is higher than average. All obtained results have been summarized in **Table 1, 2.**

Table 1. Demographic characteristics and the comprison of triage knowledge, performance and total score between categorized groups (n=84)

Demographic Characteristics	Answers	Number	Percentage	P value*		
				Knowledge	Performance	Total
Gender	Male	48	56.8	0.71	0.54	0.86
	Female	36	43.2			
Shifts	Morning	6	7.1	0.75	0.22	0.61
	Evening	2	2.4			
	Night	6	7.1			
	Rotational	70	82.3			
Triage learning method	Does not know triage	2	2.4	0.57	0.22	0.5
	Workshops	18	21.4			
	Educational courses	10	11.9			
	Books and internet	8	9.5			
	Colleagues	46	54.8			
Hospital triage is performed	yes	74	88.1	0.28	0.71	0.7
	no	10	11.9			
Who performs the triage	nobody	4	4.8	0.91	0.41	0.58
	Triage nurse	58	69			
	All nurses (rotational)	22	26.2			
Triage experience of the respondent	yes	74	88.1	0.84	0.19	0.35
	no	10	11.9			

Table 2. Comparison of questionnaire scores between male and female participants

Test	Gender	Average score	P value
Knowledge	Male	6 ± 1.7	0.71
	Female	6.5 ± 1.6	
	Both	6 ± 1.9	
Performance	Male	5.5 ± 1.8	0.54
	Female	7 ± 1.2	
	Both	6 ± 2	
Total score	Male	11.5 ± 3	0.86
	Female	13 ± 2.8	
	Both	12 ± 3.4	

Discussion

In the emergency part, one of the most important issues, recognize who need urgent help in a short time. Triage can help recognize the urgent helping to patients [2].

So in this research, we aimed to triage knowledge and performance of emergency nurses to figure out the exact structure and procedures of emergency triage management in times of crisis and in normal conditions.

The mean age of subjects in our study (31 years) was like the study by Sedaghat et al [13].

The overall results of our study indicated that the level of knowledge and performance of emergency triage nurses in hospitals of Yazd province of Iran is unacceptable since their average total written exam score was 12 ± 3.4 out of 25. Findings of many different studies are in consistent with ours. In this regard we can mention studies with similar moderate to poor test results conducted in various provinces of Iran: Sedaghat et al., 2012, north Khuzestan [13], Taheri et al., 2005, Kerman [14], Abbasi et al., 2004, Bushehr [12] and Dadashzadeh et al, 2014, Tabriz [17].

Nevertheless, Malekshahi et al. in his study in 2003 reported average level of knowledge among triage nurses [18]. Likewise, in the study of Wang et al. in 2008 it was found out that the level of nurses' knowledge on triage is moderate [19]. Moreover, the location of study might affect the results. For instance, Goransson et al., conducted a study in 2005 in Sweden and reported the mean knowledge score above average [10].

The obtained results can be easily justified. They are mainly due to lack of triage courses for nurses. However sometimes there are specific courses but the efficiency of education is low or the attendance of nurses is not satisfactory. Whatever the reason might be, these results should alert the authorities and government to modify and improve the medical education system to avoid further loss of lives and valuable resources due to decisions made by unskilled nurses.

Moderate to poor triage knowledge among nurses is not restricted to Iran. In other countries such as Ethiopia [20], Turkey [21], Taiwan [22] researches indicated low level of triage nurses' knowledge.

The methods and strategies by which we can enhance the level of triage knowledge and skills of nurses are numerous. Different triage systems are being utilized in emergency departments worldwide. These systems have been designed to assess the severity of incoming patients' conditions and assign treatment priorities. Some of the most important and internationally famous of such systems are the Australasian Triage Scale (ATS), the Canadian Triage and Acuity Scale (CTAS), the Manchester Triage System (MTS), and the Emergency Severity Index (ESI). A study conducted by Christ et al. in 2010, concluded that among the aforementioned systems, those with five-level triage strategies (CTAS and ESI) were more reliable and possessed relatively higher validity [23]. An Iranian research team assessed the effectiveness of five-level Emergency Severity Index triage system compared with three-level spot check. In their study ESI proved to be more effective and convenient [24]. Mirhaghi et al., in 2015 evaluated the outcomes of emergency severity index triage implementation in the emergency department. His

team declared ESI as a reliable and valid tool however not the one with optimal outcome especially in developing countries such as Iran [25]. These results should guide the authorities toward equipping the nurses with the most efficient available triage system.

In 2013, Rahmati et al. showed that the practice and knowledge of nurses is directly influenced by triage education and also found out that triage education will improve the qualitative indices of emergency department. Therefore, it is recommended that theoretical and practical training of triage be added to educational program of nurses in hospitals [16].

A study by Aghababaeian et al. in 2013 compared the effect of triage learning by role-playing and educational video on the knowledge and performance of emergency medical service staffs in Iran. They discovered that two educational methods equally increased knowledge and performance, however, the role-playing method may have a more desirable and lasting effect on performance [26]. A similar study in 2018 compared education by lecture and role playing. They also suggested role-playing as an effective method [27]. Another study in 2014 by Khatiban et al. showed that teaching the nurses Emergency Severity Index (ESI) triage by a special method called Problem-based learning (PBL) can significantly improve performance of nurses [28]. In conclusion, by considering these results, we would be able to choose the best possible learning methods.

Conclusion

The level of **knowledge** of the nurses employed in the emergency departments of Shahid Sadoughi University of medical sciences in Yazd is moderate in terms of triage. However, the **performance** of nurses working in the emergency departments of the aforementioned centers is higher than average. It is concluded that there is an immediate need to reconsider nurses triage education and improve the triage **knowledge** and **performance** among nurses.

Recommendation

To get a good guide, similar studies in the field of knowledge and performance, and abilities, and etc. with more samples in the different provinces recommended.

Limitation of the study

Failure to cooperate with some nurses and incomplete filling of some questionnaires were the limitations of this study.

Conflict of research

There is no conflict of interest.

Consent

Written consent was obtained from participants for participation in this study

References

1. Haghigh S, Ashrafizadeh H, Mojaddami F, Kord B. A survey on knowledge level of the nurses about hospital Triage. JNE. 2017;5(6):46-52.

2. MacKenzie EJ, et al., A national evaluation of the effect of trauma-center care on mortality. 2006;354(4):366-378.
3. Tam H, Chung S, Lou C. A review of triage accuracy and future direction. BMC Emergency Medicine. 2018;18:58.
4. Considine J, et al. Development of physiological discriminators for the Australasian Triage Scale. 2002;10(4):221-234.
5. Cooper RJ, Schriger DL, Flaherty HL, Lin EJ, Hubbell KA. Effect of vital signs on triage decisions. Ann Emerg Med. 2002;39(3):223-32.
6. Considine J, Ung L, Thomas S. Triage nurses' decisions using the National Triage Scale for Australian emergency departments. Accid Emerg Nurs. 2000;8(4):201-9.
7. Andersson AK, Omberg M, Svedlund M. Triage in the emergency department--a qualitative study of the factors which nurses consider when making decisions. Nurs Crit Care. 2006;11(3):136-45.
8. Fry M, Burr G. Current triage practice and influences affecting clinical decision-making in emergency departments in NSW, Australia. Accid Emerg Nurs. 2001;9(4):227-34.
9. Innes K, Plummer V, Considine J. Triage nurses' perceptions of their educational preparation for the triage role. Australasian Emergency Nursing Journal. 2007;10(4):205-206.
10. Göransson KE, Ehrenberg A, Ehnfors M. Triage in emergency departments: national survey. J Clin Nurs. 2005;14(9):1067-74.
11. Lin GX, Yang YL, Kudirka D, Church C, Yong CK, Reilly F. Implementation of a pediatric emergency triage system in Xiamen, China. Chin Med J (Engl). 2016;129(20):2416-2421.
12. Abbasi E, Nosrati A, Nabipour I, Emami SR. Assessment of the level of knowledge of Physicians in Bushehr Province about preparedness and response for Nuclear Emergency. Iran South Med J. 2005;7(2):183-189.
13. Sedaghat S, et al. Study on the level of knowledge and performance of North Khuzestan medical emergency 115 personnel on pre-hospital triage. IRANIAN JOURNAL OF CRITICAL CARE NURSING. 2012;5(2):103-108.
14. Taheri N, Kohan S, Haghdoost AA, Foroogh Ameri G. Assessment of knowledge and activity of nurses in triage field in hospitals of Kerman University of Medical Sciences, 2005. [Thesis]. Kerman: Kerman University of Medical Sciences; 2005.
15. Nyhus HB, Kamara MM. Quality improvement in emergency service delivery: Assessment of knowledge and skills amongst emergency nurses at Connaught Hospital, Sierra Leone. Afr J Emerg Med. 2017;7(3):113-117.
16. Rahmati H, Azmoon M, Kalantari Meibodi M, Zare N. Effects of Triage Education on Knowledge, Practice and Qualitative Index of Emergency Room Staff: A Quasi-Interventional Study. Bull Emerg Trauma. 2013;1(2):69-75.
17. Dadashzadeh A, et al. Factors affecting triage decision-making from the viewpoints of emergency department staff in Tabriz hospitals. Iran J Crit Care Nurs 2013;6(4):279-286.
18. Malekshahi F, M.Z.M. Assessment of knowledge and activity of nurses in triage of patients with trauma admitted to Shohada Ashayer Hospital. in 6th nationwide congress of nursing and midwifery; the role of nurses and midwives in emergency medicine. 2004. Tehran, Iran.

19. Wang C, Wei S, Xiang H, Xu Y, Han S, Mkangara OB, Nie S. Evaluating the effectiveness of an emergency preparedness training programme for public health staff in China. *Public Health*. 2008;122(5):471-7.
20. Duko B, Geja E, Oltaye Z, Belayneh F, Kedir A, Gebire M. Triage knowledge and skills among nurses in emergency units of Specialized Hospital in Hawassa, Ethiopia: cross sectional study. *BMC Res Notes*. 2019;12(1):21.
21. Sarikaya S, Soysal S, Karcioglu O, Topacoglu H, Tasar A. Paramedics and triage: effect of one training session on triage in the emergency department. *Adv Ther*. 2004;21(5):329-34.
22. Chen K, et al. The role tabletop exercise using START in improving triage ability in disaster medical assistance team. *Ann Disaster Med*. 2003;1(2).
23. Christ M, Grossmann F, Winter D, Bingisser R, Platz E. Modern triage in the emergency department. *Dtsch Arztebl Int*. 2010;107(50):892-8.
24. Maleki M, Fallah R, Riahi L, Delavari S, Rezaei S. Effectiveness of five-level Emergency Severity Index triage system compared with three-level spot check: an Iranian experience. *Arch Trauma Res*. 2015;4(4):e29214.
25. Mirhaghi A, Kooshir H, Esmaeili H, Ebrahimi M. Outcomes for emergency severity index triage implementation in the emergency department. *J Clin Diagn Res*. 2015;9(4):OC04-7.
26. Aghababaeian H, Sedaghat S, Tahery N, Moghaddam AS, Maniei M, Bahrami N, et al. A comparative study of the effect of triage training by role-playing and educational video on the knowledge and performance of emergency medical service staffs in Iran. *Prehosp Disaster Med*. 2013;28(6):605-9.
27. Delnavaz S, Hassankhani H, Roshangar F, Dadashzadeh A, Sarbakhsh P, Ghafourifard M, et al. Comparison of scenario based triage education by lecture and role playing on knowledge and practice of nursing students. *Nurse Educ Today*. 2018;70:54-59.
28. Khatiban M, Khazaei A, Karampourian A, Soltanian A, Kimiaei Asadi H, Salimi R, ET AL. The effects of the emergency severity index triage education via problem-based learning on the triage nurses performance and the patients length of stay in the emergency department. *Journal of Clinical Research in Paraclinical Sciences*. 2014;3(2):63-74.