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Study on the level of knowledge and performance of North Khuzestan medical emergency 115 personnel on pre-hospital triage

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ABSTRACT

Introduction: Triage is one of the most important managerial and decision-making concepts in emergency. Triage brings the most benefit to the greatest number of patients. In this regard, the present study was conducted to determine the level of knowledge and performance of medical emergency staff on pre-hospital triage.

Methods: This descriptive study was carried out on 144 subjects of medical emergency staff of North Khuzestan selected through simple random sampling; data were collected using a researcher-made questionnaire, including five demographic questions, fifteen questions on triage knowledge, and nineteen questions on triage performance, the reliability of which was evaluated by re-test and Pearson correlation coefficient. Data were then analyzed by independent t-test, ANOVA and Pearson correlation analysis using $SPSS_{18}$ statistical software.

Results: The mean age of subjects and the years of experience was 31.32 ± 3.9 and 4.20 ± 2.68 years respectively. The mean triage knowledge score (5.69 ± 2.5 out of a total score of 15), as well as triage performance (5.78 ± 3.2 out of a total score of 19) were found to be in a poor level.

Conclusion: Lack of knowledge and poor performance of medical emergency staff in terms of pre-hospital triage can be due to lack of a national guideline in the country's medical emergency, and, hence, the authorities are recommended to make attempts to resolve this problem.

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1. Introduction

Iran, as a developing country, has always subjected to crisis-causing changes during the past thirty years [1]; the solution to these crises require preparedness and planning, use of advanced systems, assurance on policy responsiveness, a successful scientific and practical program, sufficient emergency resources and adequate number of trained and efficient manpower [2]. Moreover, if manpower's training projects and programs do not meet health requirements and social conditions of the country, they will not be able to bring health to a level that people can be productive in terms of social and economic life [3]. Triage is one of the most important

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managerial and decision-making concepts in emergencies; it is derived from the word "trier" meaning classification. The purpose of triage is, therefore, to classify patients according to prioritization of disease and available resources [4, 5], and in general, it is the only approach that can most benefit the majority of patients when there is an increase in the number of referrals to the emergency or the number of injuries at the accident scene [7, 8].

Unfortunately, and considering the studies performed, there is a serious concern in terms of nurses' knowledge on triage. In a research conducted in Australia in this regard, it was found that 42% of nurses have not been trained for the triage, and 14% have indicated that they do not feel ready enough for the triage despite taking part in the triage training classes [8]. In another investigation in Sweden, it became clear that emergency departments of the country do not benefit from a codified and standardized method for triage [9].

Likewise, in Iran, no national triage scale has been notified to medical emergencies. This is alongside the fact that there is no comprehensive university course for triage training, so as only one session has been allocated to it in the emergency course of the nursing course syllabus, and holding workshops and referring to the scattered articles published in this field have been the only upcoming strategies. These failures cause no appropriate areas to be available for the occurrence of knowledge-based behavior among nurses and emergency technicians. Although, there is limited research in this area in Iran, Soloki et al., 2007, reported poor level of knowledge and performance on triage among emergency medical personnel [3]. Mirhaghi et al., 2010, also announced poor level of nurses' knowledge and performance in Zahedan University of Medical Sciences [10]. In a study by Abbasi et al., a very low level of awareness has also been observed among the clinicians of Bushehr province in dealing with nuclear incidents and diagnosis and treatment of nuclear victims [11]. The above study suggests that triage is implemented, willingly or not, in medical emergencies and hospitals in a condition that no sufficient knowledge has been provided to emergency nurses and technicians in this line.

This study aimed to identify and introduce the gap in providing services to patients referred to medical emergency using the standards required for knowledge-based triage via investigating the level of knowledge and performance among medical emergency nurses and technicians on pre-hospital triage, so that the results can expand and promote clinical decision-making capacity, evaluate emergency 115 personnel requirements, and develop a continuous and self-centered learning in the personnel. Hence, the present study was undertaken to determine the level of knowledge and performance of emergency 115 personnel of North Khuzestan on pre-hospital triage.

2. Methods

This descriptive study was conducted on all the emergency medical personnel (operators, drivers and technicians) in five centers (Shush, Shushtar, Gotvand, Andimeshk and Dezful) of North Khuzestan medical emergency centers affiliated to Ahvaz and Dezful Universities of Medical Sciences. Simple random sampling was performed on 230 subjects from emergency medical personnel, among whom 140 subjects were determined as required sample size according to Morgan Table. Data-collecting instrument was a researcher-made questionnaire including three parts; the first included five questions on demographic information such as age, marital status, educational qualification, and years of experience in medical emergencies; knowledge-related information was the second part designed for the evaluation of triage awareness and consisted of 15 multiple-choice questions on the basic concepts of triage knowledge, especially the START triage system (START system was the mode of patient examination in triage), and the third part was the performance section including a scenario with 19 injured patients in need of triage for the assessment of personnel performance. To

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Table1: Demographic information

	Mean	Standard deviation	
Age	31.32	3.948	
Work experience	4.20	2.688	
Degree	Basic (Diploma)	Intermediate (Associate's)	Paramedic (Bachelor's)
	75%	18.1 %	6.9%
Marital status	Single	Married	
	13.2 %	86.8%	
Occupational status	Operator	Driver	Technician
	10.4%	38.9%	50.7%

determine the questionnaire validity, face validity and the content validity index were used; so as the questionnaire was reviewed and the corrective feedback was applied after the questions were designed by 10 faculty members and experts.

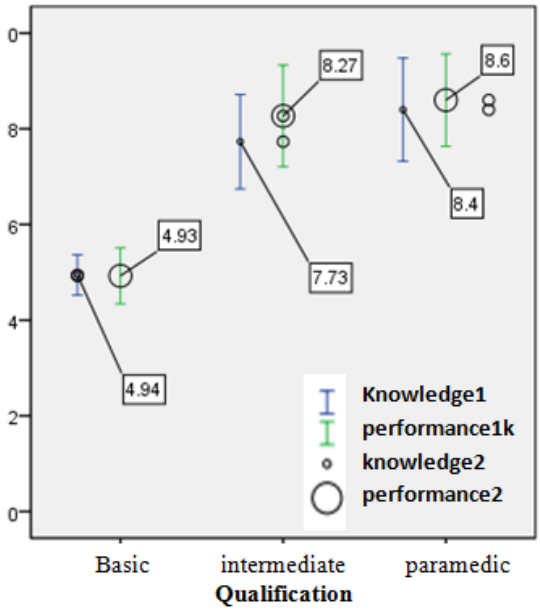


Figure 1: The relationship between educational qualification and level of knowledge and performance

Then, to determine the external reliability and stability, test-retest method was used (within ten days on 30 emergency personnel) with the Pearson correlation of 0.8 between total scores at the first and second times; Cronbach's alpha was also used to determine the validity and internal consistency of the questionnaire, for which it was achieved to be 88% and 83% for knowledge and performance questions respectively.

Data were collected in writing form from all the participants in a meeting on a specified date. For scoring the questionnaire, one point was awarded for each correct answer; therefore, the overall score of the knowledge part ranged from zero to fifteen, in which zero to five, six to ten, and eleven to fifteen were respectively indicative of low, moderate, and good level of knowledge; likewise, in the performance section, the scores ranged from zero to nineteen, in which zero to six, seven to twelve, and thirteen to nineteen were regarded as poor, moderate, and good level of performance. Data were analyzed by $SPSS_{18}$ statistical software at significance level of 0.05 in two ranges using central tendency and dispersion descriptive statistics such as frequency, mean, standard deviation, Pearson correlation, independent t-test and ANOVA.

3. Results

In this study, 144 subjects of North Khuzestan medical emergency staff were selected, demographic information of who is presented in Table 1. The results also showed that 70% of the participants had passed triage courses over the previous years.

Knowledge-related questionnaire, including 15 multiple-choice questions, each with one

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point score, showed poor level of knowledge on triage (5.69 ± 2.5 out of a total of 15); for the evaluation of performance, the questionnaire consisted of 19 questions, each with one point score, on triage practice in which each technician should triage each of the nineteen practices proposed; the results of this section also indicated a poor level of performance (5.78 ± 3.2 out of a total score of 19).

Evaluation of the relationship between participants' work experience and level of knowledge and performance, examined by Pearson correlation test, revealed a significant difference between years of experience and level of knowledge ($r=0.381$, $p< 0.001$) and performance ($r=0.389$, $p<0.001$).

In the assessment of the correlation between participants' age and level of knowledge and performance, analyzed by Pearson correlation test, a meaningful relationship has been observed between age and level of knowledge ($r=0.214$, $p=0.01$), as well as level of performance ($r=0.255$, $p=0.01$).

A significant association has also been found between educational qualification (Figure 1) and occupational status and the level of knowledge ($p<0.001$) and performance ($p<0.001$) by the variance analysis; however, no significant relationship has been observed between marital status and level of performance by t-test ($p = 0.06$) among the study participants ($p=0.06$).

4. Discussion

The mean age of participants and years of experience in emergency department was 31 and 14 years respectively. The results are indicative of a young emergency personnel with low experience; such a mean age and work experience is not beyond the expectation due to the new establishment of medical emergency in our country, especially in North Khuzestan in which medical emergency departments and centers are recently established, except for two or three cases out of approximately forty urban and road centers. In this regard, in a study by Wahhabi, 2009, the mean age and years of experience of most participants was reported to be 29 and 0-5 years respectively [12]; in a similar study by Mirhaghi, 2010, the two parameters were shown to be 29.46 ± 4.09 and 4.50 years respectively [10]. Likewise, the mean work experience was found to be 5 years in Wang study, 2008 [13]; however, it was reported to be 30-39 years in a similar study by James, 2010 [14], seven years by Brook, 2010 [15], and over fifteen years by Matthew, 2011 [16]; such a difference can be under the influence of the research location, since before the establishment of pre-hospital emergency in Iran, it has been taken advantage by many developed countries.

The frequency of participants based on marital status indicated that the majority of subjects were married (86.8%), which is expected with regard to the mean age of about 31 years, mean experience of four years, the effect of gender (all participants were male), and cultural and demographic context of North Khuzestan (consists of Lur and Arab ethnicity); the frequency of participants based on educational qualification also revealed the majority of subjects with diploma (basic technician) (75%), which is not in consistence with Brian study with bachelor (paramedic) subjects as the greatest number of participants [17], and also with Wang investigation in which more than half of the participants were observed with bachelor's and master's degree [13]; such a difference may be due to the shortage of educated manpower at the level of country emergency, and especially Khuzestan province (with more than 70% of the personnel with diploma), in comparison with other countries.

The frequency of participants based on occupational status exhibited that most of the participants were technicians (50.7%), which is not in accordance with Brian study reported more than 75% of participants as bachelor technicians [17]; such a finding is not beyond the expectation regarding the fact that all the emergency personnel have different technician degrees, and most drivers and operators are also assigned to work as technician due to lack of well-educated university technicians in Khuzestan, and

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subsequent decrease in the population of drivers and especially operators.

In the explanation of the main objective of the research, we came into the conclusion that knowledge and performance of the participants was in a poor level; in this regard, Wahhabi, 2009, have stated that low level of nurses' performance on triage is not unexpected, indicating poor knowledge of nurses in terms of triage which raises the need for retraining courses [12]. Similar results have been reported by Mirhaghi, 2010, Wahhabi, 2009, Soloki, 2007, Taheri, 2006, Sezgin, 2004, and Chin Chen, 2003, [10, 12, 3, 18, 19, 20], but contradictory findings have been achieved by Malekshahi and Mohammad zadeh, 2003, Wang, 2008, and Brian, 2001, reported moderate level of nurses' knowledge on triage [21, 13, 17]. The reason behind this difference lies in the fact that general, and not the specialized, aspects of triage has been addressed in Malekshahi study. In Brian and Goransson investigation, there is a possibility of the effect of research location on the results, as they have been conducted in European countries; however, the above-mentioned results represent moderate level of triage knowledge which emphasizes the need for more training to be provided for the staff [18]. In Wang study, the reason could be for the fact that the emergency generality has been evaluated in his study in addition to the triage.

5. Conclusion

Low level of knowledge and performance of medical emergency staff on triage can be due to lack of a national guideline in medical emergency departments, and the authorities are, therefore, recommended to make attempts to resolve this problem.

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