

# Triage Decision-Making Levels of Healthcare Professionals Working in Emergency Departments

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## Abstract

**Aim:** The aim of this descriptive and cross-sectional study was to determine the triage decision-making levels of healthcare professionals working in emergency departments.

**Materials and Methods:** The study was conducted in the emergency departments of the hospitals in Giresun between January and February 2016. The study was completed with 54 healthcare professionals who agreed to participate. Data were collected using the Socio-Demographic Data Form and Triage Decision-Making Inventory.

**Results:** There was a significant difference between the total scale scores and the status of having an emergency care certificate ( $U=-2.238$ ,  $p<0.05$ ). The mean score of the critical thinking subscale showed significant differences according to the healthcare professional's title, educational level, and the status of having an emergency care certificate ( $KW=5.974$ ,  $KW=13.785$ , and  $U=-4.260$ , respectively;  $p<0.05$ ).

**Conclusion:** The total scale score and intuition subscale were higher in healthcare professionals who had an emergency care certificate. This study suggests the training of healthcare team members who perform triage and the development of triage guidelines in emergency departments.

**Keywords:** Emergency department, healthcare professionals, triage, triage decision-making

## Introduction

Today, the increase in patient load has become a major problem in emergency departments (EDs) (1). Due to population increase, internal migrations, and ED applications of patients who do not have urgent complaints, a high number of patients are observed in EDs (2). This increase in patient density leads to longer waiting times for patients in the ED, delays in the treatment of patients having more serious health conditions, decrease in patient satisfaction, decrease in the quality of service, safety problems, and decrease in the productivity of healthcare professionals (3, 4). Therefore, it is necessary to select patients who need medical care more urgently in ED applications and determine patients' medical priorities (triage) (5).

Triage is the rapid selection and coding process performed at the scene and at every healthcare organization where patients or injured people are taken to determine those who require priority treatment and referrals in case of a high number of patients and injured people (6, 7). Triage can also be defined as determining priorities in care in terms of available resources and the severity of illness or injury (7). It is based on a quick diagnosis along with a brief interview, and it can be repeated at every stage until the end of treatment (8).

Triage is a French word and is derived from the verb "trier," which means to choose, select, classify, sift, separate, and distinguish. Medical triage was first applied in the Napoleonic period in France in the early 1800s for determining the priority of emergency care for patients/ injured people and providing emergency care



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(6, 9-11). Triage is identified as determining the priority in care and making the best decision for subsequent intervention steps (6). The concept of triage was originally developed to ensure that medical treatment and resources are used in the best and most appropriate way, especially in events when there are many injuries such as mass accidents, disasters, and war. Triage expanded later and started to be used in EDs to determine the priorities of outpatients, patients brought with ambulances, or those whose arrival is unexpected (12).

Triage is an important skill for all healthcare professionals who provide both acute care and provide direct patient care or supervise care in all areas of community health services (6). Even though the importance of triage has been emphasized in EDs in Turkey, there has been no study on the triage decision-making levels of healthcare professionals working in emergency departments these units. The descriptive study was designed to determine the triage decision-making levels of healthcare professionals working in EDs.

## Materials and Methods

### Study design

The aim of this descriptive and cross-sectional study was to determine the triage decision-making levels of healthcare professionals working in EDs. The study was conducted in the EDs of the hospitals in Giresun between January and February 2016. The participants in this descriptive study consisted of a total of 65 healthcare professionals working in EDs. In the study, it was aimed to reach the whole population without the sample selection. However, the study was completed with 54 healthcare professionals who agreed to participate. Inclusion criteria were as follows: nurses' accepting to participate and completely filling data forms. No exclusion criteria were used. The response rate was 89% (54 of 65).

### Instruments

Data were collected using the "Socio-Demographic Data Form" and "Triage Decision-Making Inventory" (TDMI). The Socio-Demographic Data Form consisted of nine questions prepared by the researchers in line with the literature and determined the sociodemographic characteristics of healthcare professionals (i.e., staff status, age, gender, educational level, marital status, total working years in the profession, working period in the ED, working type, and the status of having an emergency care certificate).

The TDMI was originally developed by Cone in 2000 as a tool for determining only ED nurses' opinions about triage decisions (13). The researchers later considered this as a limitation and tested the reliability of the inventory in nurses working in various clinics in and military nurses (6, 14). The TDMI is a 6-point Likert-type scale and consists 37 items. The items in the inventory consist of six options changing from "I strongly agree" to "I strongly disagree." The highest score obtained from the inventory is 222. The inventory has four subscales (cognitive characteristics, critical thinking, experience, and intuition). Total scale and subscale scores are obtained by dividing the sum of the scores given by the participants to the inventory. As the inventory is not a scale for diagnosis, the obtained score intervals do not express any meaning. In the first version of the scale, it was conducted with 208 ED nurses, and the

Cronbach's alpha coefficient for the whole inventory was found to be 0.95. The Cronbach's alpha coefficient for the subscales ranged from 0.84 to 0.89. The "cognitive characteristics" subscale consists of seven items. These items are related to prioritization, organization, justice, and knowledge. The "experience" subscale consists of 11 items that assess the nurses' skills to ask appropriate questions in a decision-making and triage environment. The "intuition" subscale has seven items related to emotions, instincts, and the sixth sense. Finally, the "critical thinking" subscale has 12 items evaluating the ability to acquire the necessary information to be used in the evaluation of patients and to establish communication (6).

### Data collection

Data were collected by the researchers using a face-to-face interview. The interview with each healthcare professional lasted for approximately 15 to 20 min. The purpose of the study was explained by the researchers before the application of data collection tools. The principle of confidentiality was followed by informing the participants that they are free to participate in the study and that their names would not be mentioned in the study. In order to conduct the study, written consents were obtained from the relevant institution. The study was conducted according to the ethics guidelines set out in the Declaration of Helsinki.

### Statistical analysis

Data were assessed using the IBM Statistical Package for the Social Sciences for Windows (IBM SPSS Statistics; Armonk, NY, USA) version 21.0 package program. Descriptive variables are presented as means and percentages. The normality of within-group distributions was tested by using the Kolmogorov-Smirnov test. The between-groups comparisons created on the basis of sociodemographic characteristics were performed using the Mann-Whitney U test and Kruskal-Wallis test as there was no normal distribution. The value of  $p < 0.05$  was accepted as being statistically significant.

## Results

A total of 54 healthcare professionals participated in the present study. The participants included 38 females (70.4%) and 16 males (29.6%). The mean age of the participants was 31.64 years, with a standard deviation of 7.95 years. Most participants were married (59.3%) and graduated from medical vocational high school (42.6%). In addition, the occupational experience of healthcare professionals was  $10.42 \pm 7.56$  years; 66.7% of the participants were working in the night-day shift and 83.3% did not have an emergency care certificate (Table 1).

The total mean TDMI score of the ED professionals was  $172.89 \pm 18.00$  (Table 2). When the descriptive characteristics of the ED professionals were compared with their mean TDMI scores, it was determined that there was a significant difference between the total scale scores and the status of having an emergency care certificate ( $U = -2.238$ ,  $p < 0.05$ ). The mean score of the critical thinking subscale showed significant differences according to the healthcare professional's title, educational level, and the status of having an emergency care certificate ( $KW = 5.974$ ,  $KW = 13.785$ , and  $U = -4.260$ , respectively;  $p < 0.05$ ). A statistically significant difference was found between the intuition subscale and the status of having an emergency care certificate ( $U = -3.549$ ,  $p < 0.05$ ) (Table 3).

**Table 1.** Demographic and professional characteristics of healthcare professionals (n=54)

Characteristics		
Age (Mean±SD)	31.64±7.95	
Professional experience (M±SD)	10.42±7.56	
Professional experience in the ED (M±SD)	3.50±2.46	
	<b>n</b>	<b>%</b>
<b>Staff</b>		
Nurse	24	44.4
Paramedic	17	31.5
Midwifery/Health officer	13	24.1
<b>Gender</b>		
Female	38	70.4
Male	16	29.6
<b>Marital status</b>		
Married	32	59.3
Single	22	40.7
<b>Educational status</b>		
Medical vocational high school	23	42.6
Associate degree	14	25.9
Bachelor's degree	17	31.5
<b>Having an emergency care certificate</b>		
Yes	9	16.7
No	45	83.3
<b>Working type</b>		
Night shift	18	33.3
Night-day shift	36	66.7
SD: standard deviation		

**Table 2.** Mean scores of TDMI

Subscale	n	Number of items	Mean	SD
Cognitive characteristics	54	7	32.68	6.15
Experience	54	11	54.96	5.84
Intuition	54	7	33.09	3.21
Critical thinking	54	12	52.14	9.61
Total scale	54	37	172.89	18.00
TDMI: Triage Decision-Making Inventory; SD: standard deviation				

## Discussion

Triage is one of the most important functions of the ED due to the increase in complex patients and the use of EDs (15). The purpose of triage is to put patients in order and it aims to refer the "right patient" to the right person in the right place and at the right time (16). This study was designed to determine the triage decision-making levels of healthcare professionals working in EDs.

The Emergency Nurses' Association (ENA) anticipates that the triage nurse has an experience of at least 6 months in ED, completed training and course programs about triage, and has an emergency certificate (8, 17). In this study, 83% of the healthcare professionals were determined to have an emergency care certificate. Similar to the results of the present study, Alemdar et al. (18) reported that 32.8% of the nurses did not receive any training on triage in their undergraduate education but 54.7% received triage training in the hospital. On the other hand, Sungur et al. (19) found that 64.7% of the nurses did not receive any triage training. A study by Aloyce et al. (20) reported that 22% of the nurses working in EDs received nursing training in emergency care, whereas 78% had received no such training. However, the person who will do triage should know the symptoms of the diseases that require emergency intervention (19). Lack of triage training has a relationship with inaccurate triage decisions, as knowledge on triage has been identified as a key factor that influences accuracy of triage decisions in the ED (21).

It was found that the TDMI total score was higher in the healthcare professionals with emergency care certificates in the study. Triage can be performed by a physician, a nurse, or a paramedic, but the healthcare professional doing triage needs to receive the related training (19). Healthcare professionals performing triage should be effective on decisions by its quality. The quality indicator of a triage healthcare professional, who decides who are the primary individuals to be treated with medical care, is determined by right and rapid decision-making, deep knowledge, and experience (8, 22). The reason the scale mean score of the healthcare professionals with emergency care certificates was high can be associated with triage training in the certification program in the study.

Triage decision-making is based on critical thinking, cognitive skills, intuition, and experience (13). Healthcare professionals' characteristics such as the amount of experience and level of qualification may also influence triage outcomes (23). In the present study, it was determined that the critical thinking subscale score was high in paramedics, medical vocational high school graduates, and healthcare professionals with emergency care certificates. It was observed that the critical thinking subscale score was high in the group that completed the course program and received training on triage and that their triage decision-making levels were high. This finding is consistent with a previous study (24) that explored a positive correlation between nurses with a post-secondary level qualification (compared with nurses with no additional training) and achieving the expected triage decision in EDs. Healthcare professionals performing triage should be able to rapidly identify priorities using their critical thinking skills in EDs, which are mostly complex, crowded, noisy, and stressful environments (22). The results of the present study showed a negative correlation between educational level and critical thinking skills, which was consistent with those from a previous study (25). These results are thought to be associated with the fact that paramedics are high school graduates and that they have received extensive knowledge on triage during their education. However, confidence may be a factor that influences decision-making (23, 26). Therefore, the findings from the present study may also be associated with the fact that paramedics feel more confident in decision-making and are prepared to undertake triage.

**Table 3.** Comparison of TDMI scores according to demographic and professional characteristics

	Cognitive characteristics	Experience	Intuition	Critical thinking	Total scale
<b>Staff</b>					
Nurse	33.87±5.08	56.75±4.92	33.79±3.40	52.66±9.76	177.08±17.83
Paramedic	28.76±9.17	51.53±7.81	32.30±3.44	57.00±6.33	169.62±18.98
Midwifery/health officer	34.00±2.93	55.05±4.24	32.70±2.68	47.70±9.91	169.47±17.28
p*	3.769, 0.152	3.562, 0.168	1.259, 0.533	5.974, 0.050	2.494, 0.287
<b>Educational status</b>					
Medical vocational high school	30.95±8.06	53.60±6.45	33.60±2.72	57.95±5.16	176.13±16.89
Associate degree	33.57±3.47	55.42±3.29	33.00±3.11	47.28±7.76	169.29±13.89
Bachelor's degree	34.29±4.28	56.41±6.47	32.47±3.90	48.29±11.63	171.47±22.27
p*	2.178, 0.337	0.716, 0.699	3.897, 0.142	13.785, 0.001	1.447, 0.485
<b>Emergency care certificate</b>					
Yes	31.50±13.36	55.75±10.78	37.00±2.61	64.00±2.72	188.25±27.29
No	32.88±4.10	54.77±4.73	32.46±2.81	50.26±8.86	170.40±14.83
p**	-1.571, 0.116	-1.370, 0.171	-3.549, 0.000	-4.260, 0.000	-2.238, 0.025
<b>Working type</b>					
Night shift	36.00±4.61	60.50±6.35	31.50±5.7	41.50±4.04	169.50±7.50
Night-day shift	33.41±2.74	54.41±3.89	32.00±3.10	46.25±10.15	166.08±16.09
p**	-0.977, 0.328	-0.988, 0.323	0.087, 1,000	-0.491, 0.624	-0.731, 0.465
*Kruskal-Wallis test statistic, **Mann-Whitney U test statistic. TDMI: Triage Decision-Making Inventory					

It was found that the intuition subscale was higher in healthcare professionals with an emergency care certificate in the present study. Healthcare professionals often use intuition to understand that something is wrong rather than guidelines (27, 28). The current study finding is consistent with a previous study (28) that reported triage decisions were often nonanalytic and based on intuition, particularly with increasing expertise in a pediatric ED. In the same study, nurses stated that they trusted their intuitions when they were sure of their decisions or when the ED was crowded, they were using their intuition in the triage decision-making phase. In the present study, it was observed that healthcare professionals who were trained regarding triage and had an emergency care certificate used their intuitions instead of clinical guidelines in triage decision-making. This result may be associated with the fact that healthcare professionals have difficulties in using triage guidelines due to the limited time, the urgency of the patients' situation, the need to take the patient's medical history within a short time, and the high workload. On the other hand, intuition or heuristics in triage decision-making can be faulty (27). For this reason, the development of triage decision-making guidelines to be used by healthcare professionals who are triage practitioners in EDs will contribute in delivering quality care service, in ensuring the quality of care, and in systematizing care.

#### Study limitations

The results obtained from the study can be generalized to the healthcare professionals in this sample group and are limited to the items on the inventory used in the study.

## Conclusion

It is important to determine priority and perform triage in EDs where patient admissions cannot be planned and patient density and workload are high. In this study, it was found that the total scale and intuition subscale score were higher in healthcare professionals who had an emergency care certificate. It was also found that the critical thinking subscale score was high in paramedics, medical vocational high school graduates, and healthcare professionals with emergency care certificates. In accordance with these results, it can be recommended to train healthcare team members who perform triage and develop triage guidelines. Methods such as the "triage card game" and techniques such as videos and model simulation studies can be used to make the concept and applications of triage remarkable within the scope of a course on emergency care during the training of healthcare professionals.

**Ethics Committee Approval:** Authors declared that the research was conducted according to the principles of the World Medical Association Declaration of Helsinki "Ethical Principles for Medical Research Involving Human Subjects", (amended in October 2013).

**Informed Consent:** Written informed consent was obtained from healthcare professionals who participated in this study.

**Peer-review:** Externally peer-reviewed.

**Conflict of Interest:** No conflict of interest was declared by the authors.

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