

Knowledge of triage and its correlated factors among Emergency Department Nurses

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Abstract

Background: Emergency services utilize a triage approach to rank patients according to the seriousness of their diagnoses. Triage is one of the abilities that a nurse working in an emergency room must possess. **Aim:** This study aims to examine the nurses' knowledge regarding triage and identify the variables that affect emergency nurses' knowledge of the triage systems. **Methods:** This cross-sectional descriptive study was performed from April to June 2021, on (48) nurses working in the emergency department. (ED) at Burridah central hospital in the Qassim region of Saudi Arabia. A self-administered questionnaire with non-probability purposive sampling was used to gather the data by sociodemographic data and triage knowledge. **Results:** The findings revealed that 68.8% were female and 45.8 % with a mean age of 31.79. Nurses revealed moderate levels of triage knowledge. Bachelor science nursing degree ($p = 0.005$, $B = 10.659$), years of experience for ≥ 5 years ($p = 0.002$, $B = 10.670$), and training courses on triage ($p = 0.001$, $B = 12.418$) were affecting factors with statistically significant on emergency nurses' knowledge. **Conclusions:** Findings revealed that emergency nurses had a moderate level of triage knowledge and affecting factors of nurses' knowledge were qualification, years of experience, and training courses of triage Therefore, **recommendations** for training sessions and programs should be held and taken into account the connected increases in emergency nurses' knowledge of triage to improve the quality of nursing care and patient outcomes.

Keywords: Triage, Perceptions, Nurses, Emergency Department

Introduction

Accidents and other serious situations requiring quick assistance are considered emergencies. A triage method is necessary because patients simultaneously arrive at the emergency room with conditions of varying degrees of severity (Sutriningsih et al., 2020). Modern emergency departments (EDs) use the triage procedure to rapidly determine a patient's acuity and prioritize them according to the seriousness of their problems (Fry & Burr, 2002; Moon & Park, 2017). Patients visit emergency departments in sporadic numbers and have a variety of diseases, all of which lack a clear diagnosis, urgency, or severity (Considine et al., 2007). Priority should be given to treating patients experiencing life-threatening conditions, such as cardiac arrest, airway obstruction, and shock, to save their lives. Nevertheless, a crowded emergency department (ED) can affect the quality of service by distributing resources between patients who require emergency care and others who may have less urgent requirements (Considine et al., 2007; Iserson & Moskop, 2007).

The definition of triage is "placing the patient in the best possible situation at the best possible moment to receive the best possible degree of care and the allocation of suitable resources to satisfy the patient's medical demands." This hospital location enables the assignment of the caregiver to an appropriate assessment and treatment location (Gerditz & Bucknall, 2000; Kelly & Richardson, 2001; Pozner et al., 2003). In addition to ensuring that all patients receive faster care, patient triage also ensures fairness in the distribution of emergency facilities based on the severity of the patient's illness and conditions. This is particularly important when the emergency room is constrained by time and resource constraints, such as those caused by overcrowding (Kariman et al., 2013). According to a different definition, triage is the process of managing several patients at once with few resources when there are injured patients present (Djalali et al., 2011).

Triage is acknowledged as one of the cornerstones of emergency management because, when done correctly in an emergency, it can achieve numerous departmental management

objectives (Veenema, 2008). Determining the work evaluation in an emergency department is one of these objectives. Triage is a challenging and stressful process that is a significant obstacle in a crisis involving crises and urgency. (Örtenwall, 2012; Rostampour et al., 2016) Only with proper triage and patient prioritization will it be feasible to quickly diagnose patients with acute pain and apply life-saving interventions in the shortest amount of time. In planning for disasters, nurses are essential. They should be conversant with the idea of a wave, which denotes critical conditions beyond the power, and should share a common knowledge of how to operate it and safeguard the health and safety of populations (Esmailian et al., 2014; Tadrissi et al., 2011). However, given the rising need for emergency care, the educational system for educating emergency nurses is still insufficient. Previous studies found that the emergency room has not implemented triage because of a lack of information, nurses, and patient care motivation (Faheim et al., 2019). The most important factors to improve the quality of care and patient safety are continuing education and training programs linked to triage and advanced management of medical emergencies. Therefore, it is necessary to examine nurses' perceptions regarding triage and its associated factors in the emergency department.

Significance of the study

Experienced emergency nurses have the skills necessary to do critical duties promptly. One of the required abilities for emergency nurses to perform quick assessments, patient categorization, and allocation is triage. By triage decision-making, nurses are capable of prioritizing patient care.

Aim of the study

The present study aimed to examine nurses' knowledge regarding triage and its associated factors in the emergency department.

Research Question

Q1: What is the knowledge level regarding triage for emergency department nurses?

Q2: What are the affecting factors regarding nurse triage knowledge score?

Research design

The research design uses a cross-sectional descriptive study.

Setting

The data has been applied to working nurses at the emergency department at Burridah central hospital in the Qassim region of Saudi Arabia.

Subjects and method:

Subjects:

Non-probability purposive sampling of 48 nurses from April to June 2021, on (48) nurses who worked in the aforementioned setting. The inclusion requirements include being 18 years of age or older, working full-time to offer direct care to their patients, and being employed in the hospital for a minimum of one year. However, among the exclusion criteria were individuals who were on vacation, didn't complete the questionnaires correctly, or weren't present throughout the researchers' needed data-gathering period.

Tool of Data Collection

A self-administrative questionnaire was used to get the data. These instruments are made up of the following two components:

Part I: This part includes demographic data of the nurses, including their age, sex, marital status, educational level, and years of experience.

Part II: to assess nurses' knowledge about triage was developed by (Phukubye et al., 2019). The triage knowledge questionnaire has 12 items triage is the sorting of patients into the priority of injuries or illness, the purpose of triage is to prevent the deterioration or death of a patient while waiting in queue for their turn. Each of which can be answered with "agree" or "disagree." a score of 1 is awarded for each correct response, while a score of 0 is awarded for each erroneous response. Triage scores can have totals ranging from 0 to 18. Greater triage knowledge or experience is indicated by a higher overall score. Before determining the final score, reverse-worded elements are reverse-coded. (Phukubye et al., 2019). The questionnaire had good reliability, with Cronbach's alpha of 0.88.

Operational design

The operational design includes the preparation phase, tool validity, tool reliability, field activities, pilot research, and field activities.

Preparation phase

To create methods for data collection, relevant literature for various study-related themes was researched utilizing magazines, books, journals, the internet, and other sources.

Pilot study

In a pilot study, 10% of participants were used to examine the level of clarity, viability, application, and the average time required to be completed by each respondent. Necessary changes were made. The participants in the overall study who provided these responses were not counted.

Validity of tools

The suggested tools are validated using face and content validity. Face validity entails looking at the items to determine whether the tools are measuring what they are supposed to. Analyzing whether the tools' content addressed the study's objectives is the goal of the content validity study. After the investigator constructed the tools, five specialists evaluated them. The tool was evaluated for language clarity, relevance, accuracy, completeness, simplicity, and applicability by experts in the nursing department at the aforementioned university; some sentences were rephrased with minor changes made. Then came the creation of the ultimate forms.

Reliability of tools

The reliability of the created tools was evaluated using the Cronbach alpha test. Test results for knowledge reliability among triage nurses were 0.88.

Field of work

Based on the findings of the pilot study, necessary revisions were then made. Upon receiving the study's conductors' approval from the hospital's directors. The researcher gathered information from the nurses in the aforementioned context using a self-administered questionnaire. Information was gathered during the period between April to June 2022. The researcher visited the

department of the hospital under consideration, presented their credentials, explained the goals of the study, and then handed out a questionnaire for the subjects to complete on their own. A questionnaire was provided during the morning, evening, or night shifts. The questionnaire generally takes about 15-20 minutes to complete.

Administrative Design:

This study was authorized by the ethics committee and registered with the National Committee of Bio. And Medical Ethics (NCBE) at the general directorate of health affairs in the Qassim region of the Saudi Arabian ministry of health. Also, the setting's director to gather the required information for the present study and discuss the study's purpose to obtain authorization.

Statistical analysis

The IBM SPSS software program version 20.0 was used to examine the data that were fed into the computer. (IBM Corp., Armonk, NY) quantitative data were described in terms of percentage and number. To confirm the distribution's normality, the Kolmogorov-Smirnov test was utilized. Utilizing the range (minimum and maximum), mean, standard deviation, and median, quantitative data were described. The 5% level was used to determine the results' significance. the student t-test Compares two groups under study for quantitative variables using normally distributed data. When comparing more than two groups and quantitative variables with regularly distributed, use the F-test (ANOVA). Regression to identify the knowledge-affecting component that is most independent of other factors.

Results

Table 1 The mean age of the study nurses was (31.79 ± 5.81) years. 45.8% were aged between 30-39 years; 68.8 % of females and 52.2% of the study nurses were married. 72.9% of the study nurses had a bachelor's level of education, 43.8 % of the nurses had less than 5 years of experience, and two third of nurses had attended workshops/in-service on triage.

Table 2 the total mean knowledge score was 10.94 (SD = 2.18). Displays nurses had the

highest correct answer with statements relating to Canadian triage & acuity scale charts are suitable for children and adults, also the patient's vital signs are taken after an emergency sign is identified (95.8%). While (89.6%). The triage of early warning signs is a tool used by medical services to quickly assess the severity of a patient's illness, and sort patients by priority for injury or disease. Additionally, the majority of nurses were unaware that AVPU stands for awake, verbal, pulse, and unresponsive (16.7).

As shown in (Fig. 1), the majority of nurses (64.6 %) had a moderate level of knowledge regarding triage, while 31.3 % had a low level of knowledge, and only 4.2% %

were considered to have a high level of knowledge.

As shown in **Table 3**, the association between knowledge scores and the demographic data of the study participants was determined. A significant association was recognized between knowledge score and qualification, years of experience, and training courses on triage. But, no significant difference was detected in knowledge score and sex, age, or marital status.

This table 4 shows that qualifications, years of experience, and training courses regarding triage influenced emergency nurses' knowledge of triage ($p= > 0.019$, $B= 7.158$), ($p= <0.001$, 12.811), ($p= <0.001$ $B= 12.071$) with statistically significant respectively.

Table (1): Distribution of the studied nurses according to demographic data (n = 48)

Demographic data	No.	%
Sex		
Female	33	68.8
Male	15	31.3
Age		
20-29	20	41.7
30-39	22	45.8
40 more than	6	12.5
Mean \pm SD	31.79 \pm 5.81	
Marital status		
Single	19	39.6
Married	27	56.3
Divorced	2	4.2
Qualification		
Diploma	13	27.1
Bachelor	35	72.9
Years of experience		
<5	21	43.8
5-<10	19	39.6
≥ 10	8	16.7
Min – Max	0.80 – 22.0	
Mean \pm SD	5.56 \pm 3.81	
Median	5.0	
Attended workshop/in-service on triage		
No	13	27.1
Yes	35	72.9

SD: Standard deviation

Table (2): Nurses' knowledge regarding triage (n = 48)

Q	Triage Knowledge	Correct answer
		No. (%)
1	Triage is the sorting of patients into the priority of injuries or illness.	43 (89.6)
2	The purpose of triage is to prevent the deterioration or death of a patient while waiting in queue for their turn	37 (77.1)
3	Triage early warning signs are a tool used by medical services to quickly assess the severity of a patient's sickness.	43 (89.6)
4	There are two Canadian Triage & Acuity Scale charts, one for children and adult.	46 (95.8)
5	If an emergency sign is identified in the first step the patient is taken to vital signs first.	46 (95.8)
6	If no emergency signs are identified in step 1, but an urgent sign is identified in step 2, the patient is immediately triaged yellow and asked to wait	12 (25.0)
7	Canadian Triage & Acuity Scale priority level yellow should be referred to a designated area for non-urgent	12 (25.0)
8	Patients triaged color WHITE should wait for 10 min before being attended	16 (33.3)
9	Nursing auxiliaries are not allowed to triage	40 (83.3)
10	AVPU is short for Alert, Verbal, Pulse, Unresponsive	8 (16.7)
11	Triage Early Warning Score consists of the following parameters: Mobility, Respiratory rate, Heart rate, Diastolic blood pressure, Temperature, and AVPU	46 (95.8)
12	A tiny baby under two months should always be referred to the senior health care practitioner once they have been comprehensively triaged.	31 (64.6)
13	Patients' color green or (Priority 4) should be attended to first when triaging	16 (33.3)
14	Canadian Triage & Acuity Scale has 5 color coding or priorities.	23 (47.9)
15	Triage is difficult and costly to implement in district emergency units.	16 (33.3)
16	Patients with high social status e.g., town mayor, school principals, politicians, etc. should be treated as very urgent even if triaged as color green	38 (79.2)
17	The discriminator list is not important for triage purposes.	14 (29.2)
18	Triage knowledge is not important.	38 (79.2)
Total Score (0–18)		
Min. – Max.		7.0 – 15.0
Mean ± SD.		10.94 ± 2.18
Median		11.0

SD: Standard deviation

**Figure (1):** Distribution of the studied nurses according to level knowledge score (n = 48)

Table (3): Relations between the nurses' knowledge and demographic variables related to triage (n = 48).

Demographic data	Knowledge	Test of sig.	p
	Mean ± SD		
Sex			
Male	62.59 ± 9.50	t=0.702	0.486
Female	59.93 ± 13.16		
Age			
20-29	61.94 ± 12.65	F=2.411	0.101
30-39	62.37 ± 10.56		
40 more than	50.93 ± 12.87		
Marital status			
Single	61.40 ± 10.22	F=0.328	0.722
Married	59.88 ± 12.92		
Divorced	66.67 ± 23.57		
Qualification			
Diploma	52.99 ± 12.95	t=2.923*	0.005*
BSN	63.65 ± 10.55		
Total Years of experience			
<5	54.76 ± 10.44	F=6.995*	0.002*
5-<10	67.54 ± 9.67		
≥10	60.42 ± 14.07		
Attended workshop/in-service on triage			
No	51.71 ± 11.65	t=3.524*	0.001*
Yes	64.13 ± 10.55		

SD: Standard deviation

t: Student t-test

F: F for One way ANOVA test

p: p-value for comparing the studied groups

Table (4): Linear regression analysis for the affecting factors on knowledge scores (n = 48)

	Univariate		#Multivariate	
	p	B (95%C.I)	p	B (95%C.I)
Sex (female)	0.486	-2.660(-10.283-4.963)		
Age	0.146	-3.771 (-8.907-1.366)		
Marital status (married)	0.570	-2.028(-9.164-5.107)		
Qualification (BSN)	0.005*	10.659(3.318-18.001)	0.019*	7.158(1.234-13.082)
Total Years of experience (≥5)	0.002*	10.670(4.248-17.093)	<0.001*	12.811(7.811-17.812)
Training in triage (yes)	0.001*	12.418(5.324-19.511)	<0.001*	12.071(6.083-18.059)

 $R^2=0.547$, $F=17.681^*$, $p<0.001^*$

B: Unstandardized Coefficients

LL: Lower limit

UL: Upper Limit

C.I: Confidence interval

#: All variables with $p<0.05$ was included in the multivariate *: Statistically significant at $p \leq 0.05$

Discussion

Modern emergency care in the ED includes triage. The correct training and experience are necessary for nurses to improve their triage skills since they prioritize the requirements of patients who are in critical condition in this triage (Ebrahimi et al., 2016). The present study finding discovered that more than half of the nurses had a moderate level of triage knowledge, with a mean score being 10.94 and an overall mean score of knowledge was 10.94

(SD = 2.18, range = (0-18)). This could be a result of the emergency nurses having more experience. In addition, results were generally better than those found in earlier studies (Phukubye et al., 2019; Reisi et al., 2018) and found that the participants' self-rated degree of knowledge and knowledge of ED triage as measured were consistent. High levels of triage expertise and proficiency may result in decreased emergency department (ED) overcrowding, shorter wait times, improved patient flow throughout the ED, and increased

patient satisfaction. This also indicates that the statement on the question with the highest percentage of accurate answers as there are two Canadian triage & acuity scale charts is suitable for children and adults (95.8%), if an emergency sign is identified in the first step the patient is taken vital signs first (95.8%), triage early warning signs is a tool used by medical services to swiftly assess the severity of a patient's sickness (89.6%), Triage is the sorting of patients into the priority of injuries or illness (89.6%).

Most nurses were not knowledgeable that the discriminator list is not important for triage purposes (29.2), This result concurs with a study by (Fathoni et al., 2010) found that 33% of respondents in an assessment of knowledge and skills of triage among nurses working in the emergency centers in Dar es Salaam, Tanzania, were not knowledgeable about triage, but 67% of the respondents were, which is consistent with the current study. In addition, (Afaya et al., 2017; Aloyce et al., 2014), who found that many nurses were informed about triage, agreed with the current study's findings. Additionally, (Asgari et al., 2018) discovered that nurses had modest knowledge of triage.

According to (Fathoni et al., 2013), their triage abilities were of a "moderate degree." It was discovered that 36 nurses (51.4%) had low triage knowledge and 31 nurses (44.3%) had moderate triage knowledge in the (Haghigh et al., 2017) study, which examined the triage knowledge of nurses from various disciplines. According to the study's findings, nurses had the highest rate of correctly responding to questions about the "definition of triage," "purpose of triage," "who is responsible for triage," "in the first evaluation," "color coding system," "evaluation very quickly," and "evaluation at regular intervals."

The study found a link between nurses' triage knowledge and their experience working in emergency departments. The nurses' knowledge of triage increased as their time working in the ED grew. This improvement in triage knowledge can be attributable to job exposure, several workshops and in-service training sessions attended in the ED, as well as the availability of online triage resources. According to research by (Forsgren et al., 2009), regular triage training

could help nurses become more adept at handling difficult workplace situations. In line with earlier research (Andersson et al., 2006; Fathoni et al., 2010; Salonen et al., 2007) job experience and triage knowledge were associated, especially for individuals who remained working at those emergency nurses who had worked in the ED for more than five years possessed greater triage skill than less experienced nurses in the nursing profession.

Triage nurses' expertise is influenced by a variety of factors, including their qualifications, years of experience, and training in triage. These factors have an impact on the attitude, communication, and performance of hospitals. (Kerie et al., 2018; McCann et al., 2007) the nurses' participation in several triage decision-related training, including basic life support, and ECG resuscitation training, attests to their adequate understanding.

In this aspect, the study's findings are comparable with those of earlier studies and literature that have stressed the significance of expertise and experience in decision-making throughout the triage process. Experience is one of the most crucial and effective variables in nurses' decision-making for patient triage, as demonstrated by research by (Andersson et al., 2006) It has also been observed that more experience improves decision-making stability in triage situations in the American study by (Hicks et al., 2003). Additionally, at the Dammam Medical Complex (DMC) in Saudi Arabia, emergency department nurses' level of knowledge was less than 70%, which is considered a moderate score, compared to the King Fahd Hospital emergency department nurses' degree of knowledge, which was over 70%. Additionally, this can be explained by the fact that nurses' poor knowledge of triage reflects a lack of adequate training and educational opportunities, and the triage-related content in nursing curricula across different nursing programs is insufficient to prepare nurses for the triage system in emergency units (Javadi et al., 2016). Additionally, nursing awareness is low, which suggests that nurses' knowledge of triage has not been sufficient and calls for retraining and ongoing education (Reisi et al., 2018). EDs and organizations need to promote auditing by allowing time for triage nurses to carry out the auditing to provide the triage nurses with pertinent and useful feedback.

Conclusions

The urgency, and acuity of the patients and their families that present to the emergency room put the ED nurses under a lot of pressure, making it a highly stressful and uncomfortable workplace. Especially during pandemics, disasters, and accidents, the ED can quickly become overburdened with sick and vulnerable patients without organization and effective systems. Triage is crucial in ensuring that patients are discharged to the proper areas with little wait time, that flow within the ED is unhindered, and that resources are wisely allocated based on patients' needs. Patients are prioritized according to the urgency of their need for care. Overall, emergency nurses in this study showed a moderate level of triage knowledge. In addition to, qualifications, years of experience, and training courses in triage were affecting factors on nurses' knowledge scores.

Recommendations

Although the study's findings indicated that emergency department nurses had a moderate triage knowledge level, there were still gaps in their knowledge. In light of these findings, it is essential to construct formal unit-based triaging training programs that will contribute to establishing and improving emergency nurses' triaging knowledge in EDs.

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