

KNOWLEDGE LEVEL OF NURSES ABOUT HOSPITAL TRIAGE: A SYSTEMATIC REVIEW

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ABSTRACT

OBJECTIVE:

Triage prioritizes patient care based on the severity of the injury or condition and aims to facilitate the best possible recovery for the majority of individuals within the shortest possible timeframe. This concept holds paramount importance in the realm of emergency care. The objective of this study was to assess the knowledge level of triage nurses working in hospitals.

METHODS:

This systematic review study encompassed an extensive analysis of relevant literature, drawing from international databases such as PubMed, Scopus, Web of Knowledge, and Google Scholar, as well as Iranian databases including SID, Magiran. The search spanned the period from 1980 to 2023.

RESULTS:

In the present study, 22 articles were selected for data extraction. Across all these articles, it was consistently observed that the knowledge level of the nurses ranged from low to moderate. Furthermore, two interventional studies reported a notable increase in knowledge levels among nurses following training.

CONCLUSION:

Based on the findings from multiple studies, it is evident that the knowledge level of triage nurses generally falls within the low to moderate range. Consequently, it is advisable to conduct further studies in a similar vein and implement necessary actions to address this issue.

KEYWORDS

knowledge, nurse, hospital, Iran

INTRODUCTION

Given the critical and unpredictable nature of hospital emergency departments, nurses in these settings contend with a substantial workload. The widespread issue of overcrowding in emergency departments, prevalent throughout the country, results in prolonged patient wait times and delays in delivering care [1]. This concern holds significant importance as it directly impacts patient satisfaction levels [2]. Consequently, the need for an initial assessment and prioritization of patients arriving at these departments is imperative. This examination is commonly referred to as triage in emergency departments [3]. Triage involves the prioritization of patient care based on the severity of their injuries [4] and aims to deliver optimal treatment to the greatest number of individuals in the shortest possible time. This is undeniably one of the cornerstone concepts in emergency department operations [5, 6]. Armstrong outlines the essential attributes of standard triage, emphasizing its simplicity for efficient implementation amidst chaotic and disorganized situations, its time efficiency when mere moments can determine life or death, and its reliance on predictability and reliability [7]. Given the dynamic and ongoing nature of the triage process, it is imperative to designate the most competent and proficient individuals for this responsibility. Nurses, as the largest and most crucial professional cohort within the healthcare system, assume a pivotal role in the domain of triage [8]. Hence, the paramount objective of the triage nurse is to conduct a rapid assessment of patients, assigning priority according to their clinical requirements [9]. Ultimately, the decision to assign a triage code to a patient hinge on their condition and adherence to the triage scale [10]. Triage must be executed in a manner that prioritizes patients not based on their arrival sequence but rather on the severity of their injuries and the urgency of emergency interventions. This approach ensures that essential treatments are promptly administered, deviating from the conventional routine as necessary [11].

A robust foundation of professional knowledge serves as a critical underpinning for accurate triage decision-making. The significance of this issue becomes glaringly evident when a patient, facing a health threat, is assigned to lower triage classes due to an erroneous decision by the triage nurse [12]. Research has discerned that the primary reason behind such occurrences is the insufficient knowledge in the realm of triage, with findings indicating that possessing

comprehensive knowledge about triage outweighs the importance of work experience [13]. Consequently, the absence of requisite and standardized knowledge in the domain of triage can lead to detrimental consequences [12]. Numerous studies have probed into the knowledge levels of nurses regarding triage, sparking considerable apprehension within this domain. For instance, a study conducted in Sweden revealed the absence of a standardized triage methodology in the country's emergency departments, coupled with inadequate training for nurses in this domain [14]. Similarly, Mirhaghi and Roudbari [12] study uncovered nurses' unfamiliarity with hospital triage knowledge and identified a lack of mandatory adoption of a valid and dependable triage scale within the emergency departments of the scrutinized hospitals.

In Iran, the responsibility for triaging patients in emergency departments typically falls on nurses. The inception of hospital triage in these departments is a relatively recent development. Initially, hospital triage was introduced in larger urban centers, particularly in social security hospitals, and subsequently in university-affiliated medical centers [15]. Regrettably, to date, no comprehensive study has been undertaken to consolidate existing research in this area. Hence, the present study was conducted with the objective of assessing nurses' knowledge levels concerning hospital triage.

METHODS

A comprehensive systematic review of pertinent studies was undertaken. It followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) to ensure transparency and rigor in the reporting process [16]. The study used international databases including PubMed, Scopus, Web of Knowledge, and Google Scholar, alongside internal databases such as SID (the Scientific Information Database of the Academic Center for Education, Culture and Research, Iran) and Magiran (a database of Periodicals published in Iran), encompassing the years from 1980 to 2023. The search employed keywords including "Nurse," "Emergency department," "Knowledge," "Triage," "Iran," and "Hospital," combined using the OR and AND operators to refine the results. The titles and abstracts of articles were independently assessed by researchers to determine their relevance to the topic. All original articles were gathered and scrutinized for inclusion in the study. Inclusion criteria encompassed: 1) the

presence of the keywords in the title or abstract and 2) the provision of awareness levels in the form of descriptive statistics. Studies in the form of theses, books, and abstracts from congresses and conferences were excluded from consideration."

SELECTED STUDIES QUALITY ASSESSMENT

A quality score, adapted from the Newcastle-Ottawa scale, was employed to assess the suitability of research design, recruitment strategy, response rate, sample representativeness, objectivity/reliability of outcome determination, provision of power calculation, and utilization of appropriate statistical analyses [17]. Studies receiving a score on this scale below seven on quality assessment were subsequently excluded from the analysis.

DATA EXTRACTION AND ANALYSIS

During the subsequent phase, data extraction was carried out from each of the articles that met the inclusion criteria. The extracted information encompassed the first author's name, year of publication, study type, number of participants, their average age, the type of study tool

employed, and the level of awareness assessed. To ensure the qualitative content validity of the assessment tool, input was sought from ten experts. The scale was distributed to these experts, and their feedback was collected and taken into consideration. Subsequently, the scale was refined and its content validity was confirmed.

RESULTS

In the initial search across the aforementioned databases, a total of 42 articles were retrieved. Following a meticulous evaluation based on the detailed steps outlined in Figure 1, 22 articles were deemed suitable for inclusion in the study [12, 15, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37]. Conversely, 28 articles were excluded from the study for various reasons, including lack of relevance to the study's objectives (14 articles), absence of explicit documentation of nurses' knowledge levels in descriptive statistics (6 articles), and inadequacy in the methodological quality upon thorough examination (8 articles).

FIGURE 1. PRISMA DIAGRAM OF HOW ARTICLES ARE INCLUDED IN THE STUDY

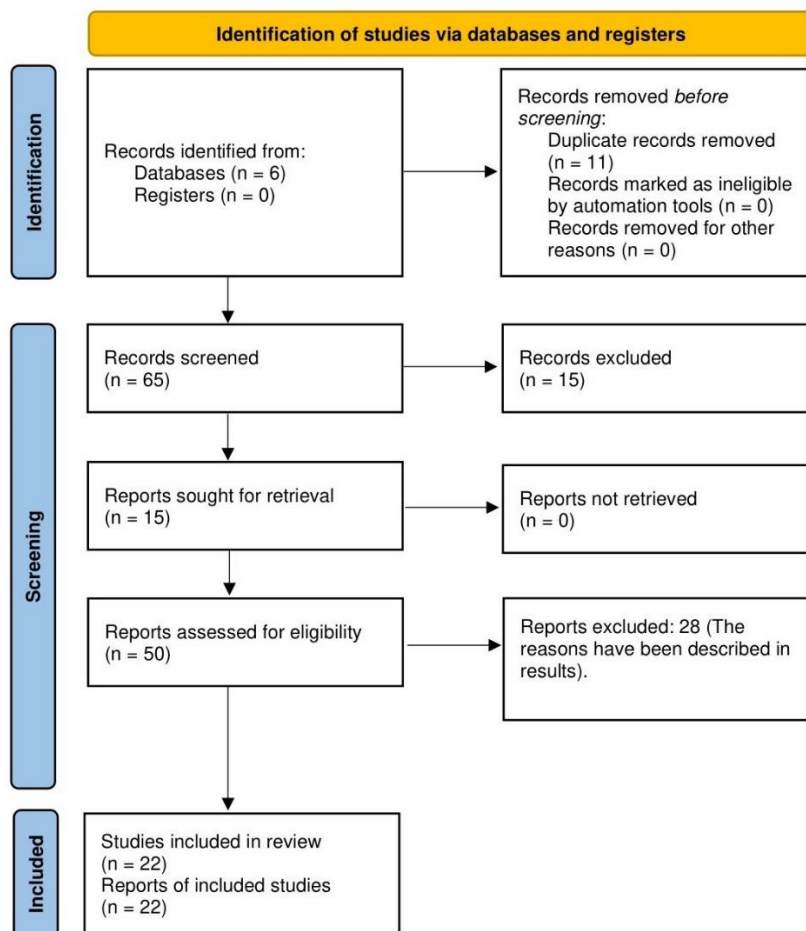


Table 1 provides an overview of the studies, indicating that the majority of them employed a cross-sectional research design. Notably, only one study involved nursing students [22]. The average age of participants in these articles ranged from 21 to 49 years old. It is noteworthy that, except for four studies [19, 25, 33, 37], the remaining studies utilized researcher-developed tools to gauge the knowledge level of nurses regarding triage. This underscores the imperative

need for designing a standardized assessment tool for the broader utilization of researchers in this field. In terms of knowledge levels, the findings consistently indicated that nurses' knowledge fell within the moderate range across all studies. However, it is worth highlighting those two experimental studies reported a significant increase in awareness levels following training [20, 23].

TABLE 1. DETAILS OF THE ARTICLES INCLUDED IN THE STUDY

Item	Author [year]	Study type	Study place	Sample [size]	Mean age [SD] or N [%]	Scale	Mean of knowledge (SD) or N (%)
1	Fathoni (2010) [19]	Cross-sectional	Indonesia	Nurses [266]	-	Triage Knowledge Questionnaire	55.26 (13.16) [Weak level]
2	Aloyce (2014) [18]	Cross-sectional	Tanzania	Nurses [66]	-	Questionnaire - developed by the researcher	33% had no knowledge
3	Kalantarimeibidi (2014) [20]	Experimental	Iran [Shiraz]	Nurses [50]	33 [3.2]	Questionnaire - developed by the researcher	Previous of intervention: 7.5 (2.1) and after intervention: 14 (1.6)
4	Javadi (2016) [21]	Cross-sectional	Iran [Yazd]	Nurses [45]	34 [6.80]	Questionnaire - developed by the researcher	6.33 (1.96) [Average level]
5	Mirhaghi (2011) [12]	Cross-sectional	Iran [Zahedan]	Nurses [102]	29.46 [4.09]	Questionnaire - developed by the researcher	5.64 (1.54) [Weak level]
6	Tabatabai (2013) [22]	Cross-sectional	Iran [Tehran]	Nursing students [124]	-	Questionnaire - developed by the researcher	9 (2.7) [Weak level]
7	Haghdooost (2009) [23]	Experimental	Iran [Rasht]	Nurses [40]	Upper than 33 [32.5%]	Questionnaire - developed by the researcher	Previous of intervention: 16.25 (5.73) and after intervention: 30.67 (5.51)
8	Sardar (2013) [24]	Cross-sectional	Lahore	Nurses [100]	27.55 [6.31]	Questionnaire - developed by the researcher	9.51 (2.91) [Weak level]
9	Haghigh (2017) [15]	Cross-sectional	Iran [Ahvaz]	Nurses [70]	31 [9.05]	Questionnaire - developed by the researcher	36 nurses (51.4%) were weak
10	Robison (2002) [25]	Cross-sectional	USA	Nurses [82]	-	Darnall MASCAL Triage Test	51.25 (2.85) [Average level]

11	Phukubye (2019) [26]	Cross-sectional	South African	Nurses [84]	35-49 [51%]	Questionnaire - developed by the researcher	61% of nurses were good
12	AlShatarat (2022) [28]	Cross-sectional	Saudi Arabia	Nurses [172]	36 [5.60]	Triage Knowledge and Practices Questionnaire	11.78 (3.01) [High level]
13	Asgari (2018) [29]	Cross-sectional	Iran [Ilam]	Nurses [160]	30 [4.11]	Questionnaire - developed by the researcher	10.44 (2.11) [Average level]
14	Al-Metyazidy (2019) [30]	Cross-sectional	Egypt	Nurses [46]	34.59 [7.12]	Questionnaire - developed by the researcher	Majority of nurses had poor level of knowledge
15	Esmaealpour (2022) [31]	Cross-sectional	Iran [Jahrom]	Nurses [74]	-	Questionnaire - developed by the researcher	15.06 (3.12) [Average level]
16	Twagirayezu (2021) [32]	Cross-sectional	Rwanda	Nurses [96]	-	Questionnaire - developed by the researcher	63.6% of nurses demonstrated low level of triage knowledge
17	Elgazzar (2021) [33]	Cross-sectional	Saudi Arabia	Nurses [48]	31.79 [5.81]	Phukubye,s Triage Knowledge Questionnaire	10.94 (2.18) [Average level]
18	Afaya (2017) [34]	Cross-sectional	Ghana	Nurses [65]	21-30 [70.8%]	Questionnaire - developed by the researcher	62.6% of nurses demonstrated good level of triage knowledge
19	Sherafat (2019) [35]	Cross-sectional	Iran [Yazd]	Nurses [84]	34.8 [6.6]	Questionnaire - developed by the researcher	6 (1.9)
20	ALI (2013) [36]	Cross-sectional	Pakistan	Nurses [100]	27.55 [6.31]	Questionnaire - developed by the researcher	9.16 (2.56) [Weak level]
21	AlMarzooq (2020) [37]	Cross-sectional	Saudi Arabia	Nurses [138]	26-35 [66.6%]	Mohammed,s Triage Knowledge Questionnaire	Majority between moderate level and high level
22	Duko (2019) [27]	Cross-sectional	Addis Ababa	Nurses [101]	28.50 [4.32]	Questionnaire - developed by the researcher	9.54 (2.32) [Weak level]

DISCUSSION

The present review study was undertaken to assess nurses' knowledge levels regarding triage. In a study conducted by Mirhaghi and Roudbari [12], the findings revealed that 94.39% of the sample's responses to the questionnaire were deemed incorrect, signifying a weak level of knowledge. Furthermore, in the research conducted by Abbasi, Nosrati

[38], the knowledge level of doctors pertaining to triage and nuclear treatment was reported to be at 39.69%. However, in a national study conducted by Göransson, Ehrenberg [14], the level of knowledge among nurses regarding triage was categorized as average. Likewise, in a study by Malekshahi and Mohammadzadeh [39], which aimed to assess the knowledge and attitudes of nurses concerning the triage of injured patients admitted to

Shohdai Ashair Hospital of Khorramabad in 2012, the overall knowledge about triage was reported at 53.9%, falling within the average range. Indeed, it's important to note that in their research, Malekshahi and Mohammadzadeh focused on the broader aspects of triage for the injured and did not specifically assess hospital triage. In another study conducted by men in Ahvaz to evaluate the knowledge and attitudes of nursing students regarding triage, the results showed that 57.1% of the samples possessed good knowledge about triage [40]. In contrast, Mirhaghi and Roudbari [12] study found that 20% of the participants had no knowledge of triage. In their study, Moaddab and Bahrami [41], which aimed to identify the challenges and issues related to triage from the perspective of nurses in a selected medical training center, reported that 86% of the participants had not completed a triage training course. Additionally, 68.8% of the respondents believed that there was no unified triage system in the healthcare system, and the lack of coordination and consistency in triage implementation had undermined its effectiveness. In the study conducted by Dadashzade, Abdolazade [42], 38.2% of the participants had not undergone specialized training to learn triage.

Accurate and timely triage of patients represents a cornerstone of successful operations within the emergency department. Choosing an incorrect triage level, stemming from misinterpretation or the disregard of patient variables and triage criteria, often attributable to inadequate knowledge or performance, can result in a triage error for the nurse [43]. Triage errors can manifest in various ways, including the assignment of patients to a lower level or 'light' triage category, which can result in prolonged waiting and the deterioration of their condition. Conversely, overclassifying patients into a higher or 'heavy' triage category may impede access for other patients in need of immediate care [12]. The primary factors contributing to light triage include a lack of awareness and adequate knowledge, negligence regarding high-risk situations, and the failure to correctly interpret vital signs. Light triage not only leads to delays in diagnosing and treating severely injured patients but can also result in serious consequences, including fatalities [44]. Light triage in the emergency room can indeed have adverse effects on hospitalized patients during their hospital stay. Conversely, heavy triage primarily poses challenges related to resource allocation and can divert hospital staff from other critical activities [45]. Numerous studies conducted in Iran and around the world have consistently

pointed to a lack of knowledge as the primary driver of triage errors. In summary, many of these studies have assessed the knowledge level of nurses regarding triage as weak. Given that nurses are the frontline personnel responsible for triage in medical centers, this underscores the substantial risk associated with triage errors.

LIMITATIONS AND RECOMMENDATIONS

This study encountered several limitations, including the scarcity of available studies for a more comprehensive summary. The high degree of heterogeneity among the identified studies precluded the possibility of conducting a meta-analysis. It is recommended that, given the importance of this topic in enhancing public health, descriptive studies be conducted to gather foundational information and assess the situation nationwide. Subsequent research efforts could focus on exploring effective and practical strategies to enhance the knowledge and performance of nurses and other healthcare personnel in triage, thereby contributing to improved patient care in emergency settings.

IMPLICATIONS FOR PRACTICE

Triage stands as one of the foremost critical measures in emergency wards, underscoring the importance of comprehending and assessing nurses' knowledge about triage. The outcomes of this study hold the potential to serve as a stepping stone for future research, enabling more precise evaluations of nurses' knowledge and performance in triage. Additionally, by consolidating previous research findings, this study has provided a comprehensive overview, serving as a noteworthy cautionary note regarding nurses' knowledge in this vital area.

Assessing nurses' knowledge of hospital triage can reveal specific areas where they may lack understanding or competence. This information can be used to tailor educational programs and training interventions to address these gaps effectively. A comprehensive study can help healthcare institutions identify weaknesses in their triage systems. When nurses are well-versed in triage, it can lead to more accurate assessments, which, in turn, can contribute to higher-quality patient care and better outcomes. Understanding nurses' knowledge levels in triage can directly impact patient safety. Nurses who are better educated in triage are less likely to make errors in prioritizing patients, which can reduce the risk of adverse events and patient harm. Regular assessments of nurses' triage knowledge can serve as a foundation for ongoing

improvement efforts. Healthcare institutions can use this data to track changes in knowledge levels over time and adapt their training programs accordingly.

CONCLUSION

Based on the results gleaned from diverse studies, it is evident that the knowledge and awareness levels of nurses concerning triage generally fall within the weak to moderate range. It is strongly recommended that additional related studies be undertaken to further explore and address this issue. Moreover, healthcare authorities should take significant measures aimed at enhancing this crucial knowledge among nurses, ultimately leading to improved patient care in emergency settings.

CONFLICT OF INTEREST:

The authors declare that they have no competing interests.

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