

Perception and Satisfaction of Nursing Staff Regarding Triage Application in the Emergency Department

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Abstract

Background: Triage is an essential function of staff in the emergency department. Nurses' knowledge about triage is decision making, and effective decision-making can influence the health outcomes of patients. Which they play a key role in triage application should be sufficiently prepared to enhance the triage nurse will be adequate perception and positive satisfaction regarding triage application in the emergency department. **Aim:** Assess perception and satisfaction of nursing staff regarding triage application in the emergency department. **Design:** A descriptive research design was used. **Setting:** This study was carried out at Emergency Department at the Emergency and Reception Hospital of Cairo University, Egypt. **Sample:** A convenient sample of 80 nurses. **Tool:** One tool was used to collect study Demographic data: Nurses Knowledge, Practices, Perception, and Satisfaction through self-administrated interview questionnaire. **Results:** Results of the present study showed that 58.8% of the studied nurses had satisfactory level of knowledge, 61.3% of studied nurses had adequate level of total perception, 63.8% of studied nurses had adequate level of total practices, and 63.8% of studied nurses had positive satisfaction level about triage application in the emergency department. **Conclusion:** there was a positive strong highly statistically significant correlation between knowledge, practice perception, and satisfaction level regarding triage application in the emergency department among the studied nurses. **Recommendations:** Providing in-service educational training programs based on nurses' needs to improve their knowledge and practice related to triage application in the emergency department in both Arabic and English languages.

Keywords: Application, Department, Emergency, Nursing staff, Perception, Satisfaction, Triage.

Introduction:

The emergency department (ED) is a very important lifesaving department where the clients admitted under emergency conditions are treated well. It is a 24-hour service, and the nurse is an important member of the emergency team. Emergency nursing is a specialty within the field of professional nursing focusing on the care of patients with medical emergencies, Emergency nurses are most frequently employed in hospital emergency departments (**Hassan et al., 2019**).

Triage originates from the French word "trier," which is used to describe the processes of sorting and organization. Triage is utilized in the healthcare community to categorize patients based on the severity of their injuries and, by extension, the order in which multiple patients require care and monitoring. The triage of patients in the ED is a worldwide healthcare problem. Triage is commonly defined as an essential procedure in ED that involves sorting patients according to priorities (**Yancey & O'Rourke, 2022**).

Triaging application is a sorting of patient from a life-threatening condition to a mild illness. Studies have reported that about half of victims visiting the ED are not urgent, which generates higher costs and numerous negative effects. There are three interconnected elements that affect decision making for triage; the patient condition, the triage decision-maker and policy of hospital. Triage is essential for saving time and admission rates, enhancing the competence of the ED, increasing patient and family satisfaction, and managing findings (**Badawy et al., 2018**).

The role of nurses in triage is crucial in determining the priority of medical care for patients. The nurses assess patients and evaluate patients by conducting initial screenings, assessing their symptoms and complaints, and gathering relevant medical history. The nurses use their judgment and specialized knowledge to identify urgent or life-threatening cases. Prioritizing patients based on the assessment, nurses assign a level of priority to each patient, categorizing them as immediate, urgent, or non-urgent. This helps healthcare providers in determining the order in which patients should receive medical attention (**Magnusson et al., 2020**).

The nurses' perception of triage refers to how nurses understand the importance and interpret the concept of triage in healthcare settings. The perception of triage among nurses can vary based on their experiences and individual perspectives. Nurses may perceive triage positively because it allows them to utilize their critical thinking skills, prioritize care effectively, and potentially save lives in emergency situations. The nurses appreciate the structured approach that triage provides in rapidly identifying and addressing the most severe cases. Triage also helps nurses allocate limited resources efficiently, ensuring that the most critical patients receive the necessary interventions (**Phukubye et al., 2021**).

Nursing job satisfaction is one of the complex areas, consisting of various kinds of feelings and conditions. As environment becomes competitive and complex day by day, the importance of job satisfaction and its relationship with employees' performance also increases (**Inayat & Jahanzeb Khan, 2021**). The staff's job dissatisfaction, on the other hand, is reflected in their attitudes towards their jobs. The employees who were satisfied with their work showed a positive attitude towards their jobs while people dissatisfied with their jobs had a negative attitude (**Faramarzpour et al., 2021**).

Significance of the study:

There are more than 140 million visits to emergency departments (EDs) in the United States (US) each year. EDs are intended and designed to provide prompt care for unexpected and unscheduled medical situations. Since emergencies sometimes result in death, all EDs must prepare for this eventuality. Although the number of deaths in EDs decreased from 1997 to 2011. From 1992 to 2006, it is estimated one-half of patients older than 65 years visited an ED in the last month of life (Elmer et al., 2022).

Egypt's healthcare sector is changing. It may lag its neighbors in the based on the Middle East and North Africa (MENA) region, but it is starting to catch up fast and that presents opportunities for investors. Based on Colliers research, by 2030, Egypt will require approximately 38.000 new beds (based on Egypt's ratio 1.3 beds / 1.000 population) with an estimated investment of US\$8 to 13 billion and up to 120.000 new beds MENA ratio of 1.9 beds/1.000 population) (Ahmed, 2020).

The total number of staff involved in emergency medical services in Egypt estimated to be 6.809 in the year 2010. The number of emergency personnel continue to increase up to 17.132 in the year 2014. The number then dropped to 16.500 in 2015 due to resignation because of the harsh work environment and low incomes. A reported statistic from Cairo university hospitals indicated that the hospital received 400 trauma patients per day and 500.000 emergency outpatients per year. The number of patients consulted per hour in the emergency department reaches 50 patients (Faheim et al., 2019).

Aim of the study:

This study aims to assess perception and satisfaction of nursing staff regarding triage application in the emergency department through the following objectives:

1. Assess nursing staff's level of knowledge regarding triage application in the emergency department.
2. Determine nursing staff's level of perception regarding triage application in the emergency department.
3. Appraise nursing staff's level of satisfaction regarding triage application in the emergency department.

Research questions:

1. What is the level of knowledge among nursing staff regarding triage application in the emergency department?
2. What is the level of perception, and reported practices among nursing staff regarding triage application in the emergency department?
3. Is there a relationship between nursing staff's knowledge, perception, reported practices, and their satisfaction?

Subjects and Method

Research design:

A descriptive design was utilized for conducting this study.

The study setting:

The current study was conducted in the emergency department at the Emergency and Reception Hospital of Cairo University, Egypt. The Emergency and Reception Hospital is in El Rawda, Manial, Cairo and it consists of 9 multi-specialty floors. The first floor of the hospital houses the Department of Emergency, Cardiology, and Neurology. It also has an initial examination department with 17 beds, a surgical suite with two operating rooms, and a trauma room. The first floor additionally features an emergency laboratory, blood bank, and radiology department. The total number of nurses on the first floor is approximately 85.

Subjects:

A convenient sample of (80 nurses) working in the emergency and reception department at the Emergency and Reception Hospital of Cairo University, Egypt. All nursing staff are accepted to participate in the study from both genders, with different educational levels and working in the previously mentioned setting.

Tool for data collection:

The data of this study was collected using a structured interview questionnaire divided into four main parts:

Part I: Demographic characteristics of nurses;

It included thirteen questions about age, gender, marital status, qualifications, years of study, years of experience in the ER, and previous attendance of training courses related to triage. In addition, questions about and type of emergency department and type of triage system that is applied in the hospital.

Part II: Nursing staff's Knowledge about triage application:

It was constructed by the researcher after reviewing relevant literature. It included two sections that represented the following:

- **Section I:** It concerned with the nurses' knowledge about triage that consists of (17) multiple-choice questions (MCQ). The questionnaire includes items such as the term "triage" world means, triage definition, levels of triage, time-limited for each level, triage help nurses to, factors affecting triage, triage process, characteristics of an efficient triage nurse, the triage process is done by, the most important role of the triage nurse, and four situations triaged by the nurse.
- **Section II:** It was concerned with the nurses' knowledge about coding color of triage system and consisted of (4) true and false questions.

Scoring System:

The tool contained (21) questions with (21) total scores of the questionnaire. Knowledge obtained from the studied nurses was checked with a model key answer, (1) grade was given for the correct answers, and (zero) grades were given for incorrect answers. The total knowledge scores ranged from 0 – 21. The total scores of knowledges were summed up and converted into a percentage score. It was classified into 2 categories:

- **The satisfactory knowledge** if the total score is $\geq 60\%$ ($\geq 13 - 21$).
- **The unsatisfactory knowledge** if the total score is $<60\%$ ($0 - <13$).

Part III: Nursing staff's perception about triage application:

It was adapted and modified by the researcher. It was designed in the Arabic language and consisted of (23) items, on the perception of nursing staff about triage application, the questionnaire sheet includes items such as beliefs about the triage system effects, the importance of the role of the nurse in the application of the triage in the ED, implementation of the triage system needs, believe about the key role of the triage system in providing emergency health care in ED as a priority, courses, conferences, and scientific activities that enhance the importance of applying the system of triage in ED, obstacles to the application of the triage system, triage system helps nurses, triage aims, public awareness regarding triage, thinking studying triage is difficult, and believe that nurse's morale has improved by using triage.

Scoring System:

A scoring system to assess perception of nursing staff about triage application; using Likert scale as agree that take (3), neutral that take (2), and disagree that take (1), These scores were summed and converted into a percentage score.

- **negative perception level** If the total score is ($<60\%$) ($0 : < 28$).
- **positive perception level** If the total score is ($\geq 60\%$) ($\geq 28 : 46$).

Part IV: Nursing staff's reported practices regarding triage application:

It was adapted and modified by the researcher. It was designed in the Arabic language and consisted of (30) questions on triage application with three choices (always, sometimes, and never). That questionnaire sheet includes items such as prioritization of patients, assessment of the patient, allocation of patients, and documentation, re-triaging for waiting patients, delegating work to other staff, managing the waiting room, working safely and quickly, applying ethical principles diligently in triage, provide culturally sensitive, the quality of care, communicate the status of patients, and control infection.

Scoring System:

A scoring system to assess nurses' reported practice; each skill was assigned a score according to sub-item, using Likert scale as always that take (3), sometimes that takes (2), and never that take (1). These scores were summed up and converted into a percentage score.

- **Adequate practice** If the total score ($\geq 60\%$) ($\geq 34 : 56$).
- **Inadequate practice** if the total score is ($<60\%$) ($0 : < 34$).

Part V: Nursing staff's satisfaction regarding triage application:

Satisfaction of Employees in Health Care (SEHC) sheet adopted from (Alpern, et al., 2013). It was designed in the Arabic language and consisted of (20) items, the questionnaire sheet includes items such as the

management of this organization is supportive, the provision of support, gaining new skills, encouraged, the management makes changes based on my suggestions and feedback, regular triage work duties, the organization rules, chances for triage application and promotion, adequate opportunities to develop my professional skills, provision of resources, accurate written job description, work assignments are always clearly explained, work is evaluated based on a fair system of performance standards, the buildings, grounds, and layout of this facility, coworkers and I work well together, easily communicate with members, would recommend this health facility to other, and the health facility as a place to work.

Scoring System:

A scoring system to assess nurses' satisfaction regarding triage application; using three Likert scales for easing data collection, agree that take (3), neutral that take (2), and disagree that take (1). These scores were summed up and converted into a percentage score.

- **Low satisfaction level** if the total score is (<60%) (0 :< 12).
- **High satisfaction level** if the total score (≥60%) (≥12: 40).

Validity:

Content validity refers to the extent to which the items on a test are representative of the entire domain the test seeks to measure and seek to assess the quality of the items on a test (Fingland, et al., 2021). The developed tool was formulated and submitted to a jury of five experts (assistant professors and lecturers) in Community Health Nursing, and Medical Surgical Nursing from Faculty of Nursing- Helwan University to assess the content validity. Their opinion was elicited regarding tools consistency, rephrasing for some statements, and the scoring system.

Tools Reliability:

A specific measure is reliable if its application on the same object of measurement sometimes produces the same results. It was conducted for the developed tool, to achieve the criteria of trustworthiness of the tool reliability. To assess reliability, the study tool was tested by the pilot subjects at first session for calculating Cronbach's Alpha (Knowledge questionnaire = 0.987, Perception questionnaire = 0.927, Reported practices = 0.845, and Nursing staff's satisfaction = 0.826. The statistical equation of Cronbach's Alpha reliability coefficient normally ranges between 0 and 1 higher value (more than 0.7) denotes acceptable reliability (Sürücü & Maslakci, 2020).

Ethical Consideration:

The researcher obtained approval from the Ethical Committee of the Faculty of Nursing at Helwan University. Afterward, they interviewed the Director of the Emergency and Reception Hospital of Cairo University, reviewed the protocol papers and research tools, and obtained approval signatures from both the

Director of Nursing and the hospital's training unit. The researcher was then directed to the training unit in the hospital, which coordinated the entry into the emergency and reception department.

To ensure transparency, the researcher explained the objectives and aim of the study to the participating nurses before commencing. Oral consent was obtained from the nurses to ensure confidentiality and the data was used solely for research purposes. The researcher ensured the anonymity and confidentiality of the subjects' data included in the study. Additionally, the participating nurses were informed of their right to withdraw from the study at any time.

Field work:

The fieldwork undertaken consisted of the following steps:

- Approval was obtained from the scientific and ethical committee of the Faculty of Nursing at Helwan University. The study subjects were then individually asked for verbal agreement to participate in the study.
- The researcher met and introduced himself to the nurses at the selected settings and explained the purpose of the study. The researcher then assessed the nurses individually using specific tools.
- The participants were informed about voluntary participation, their right to withdraw at any stage of data collection, and the need to keep their identity confidential.
- The nursing staff's demographics and work data questions, the nursing staff's knowledge questionnaire sheet, the nursing staff's perception questionnaire sheet, the nursing staff's reported practices questionnaire, and the Satisfaction of Employees in Health Care (SEHC) questionnaire sheet regarding triage application were distributed to all nurses. The researcher was present while the nurses filled in the questionnaires to ensure that the questions were answered completely.
- The questionnaires were delivered immediately to the researcher upon completion to avoid biases resulting from the interaction of nurses with each other. The time required to complete the questionnaire was around 30-45 minutes.
- The data was collected over five months, from June 2022 to September 2022. The researcher was available in the study setting two days per week throughout the morning shift from 9:00 AM to 1:00 PM. Every time met two nurses.
- The studied nurses were assured that the information collected would be treated confidentially and used only for the study which he interviewed one nurse every time and sometimes the same nurse interviewed two times.

Statistical Analysis:

The collected data were organized, tabulated, and statistically analyzed using SPSS software (Statistical Package for the Social Sciences, version 25, SPSS Inc. Chicago, IL, USA). For quantitative data, the range, mean, and standard deviation were calculated. For qualitative data, which describes a categorical set of data by frequency, percentage or proportion of each category, comparison between two groups and more was done using Chi-square test (χ^2). Correlation between variables was evaluated using Pearson's correlation coefficient (r).

Results:

Table (1) Shows demographic characteristics among the studied nursing personnel, it illustrated that 51.3% of studied nursing personnel aged between 30 - 39 years old with a mean age of 31.8000 ± 9.03635 . Also, 58.8% of the studied nursing personnel were female, 56.3% of them were married while 17.5% of them were single, 68.8% of them had a bachelor's degree, and 51.3% of them worked for 3–5 years. Regarding the type of emergency department (ED) 68.8% of them answered general ED (adult and children), and the majority (81.2%) of them answered yes to the application of the triage system in the hospital, respectively.

Figure (1): It clarifies that 58.8% of the studied nurses had a satisfactory level of knowledge regarding triage application in the emergency department.

Figure (2): It is evident that over 61.3% of the nurses had an adequate level of perception of the triage application, while approximately 38.8% of the nurses have an inadequate level of perception regarding the triage application in the emergency department, respectively.

Figure (3): It illustrates that 63.8% of studied nurses had an adequate level of total practices about triage application in the emergency department, but 36.3% of studied nurses had inadequate level of total practices about triage application in the emergency department, respectively.

Figure (4): It illustrates that 63.8% of studied nurses had high satisfaction level about triage application in the emergency department, but 36.3% of studied nurses had low satisfaction level about triage application in the emergency department, respectively.

Table (2): It clarifies that there was a positive strong highly statistically significant correlation between knowledge, practice perception, and satisfaction level regarding triage application in the emergency department among the studied nurses at $r= 0.597- 0.784$ & $P= 0.000$).

Table (1): Number and percentage distribution of demographic characteristics among the nurses studied, (N=80).

Demographic data	The studied sample (N=80)	
	No.	%
• Age:		
- 20-<29	29	36.3
- ≥ 30 -<39	41	51.3
- ≥ 40 -<49	3	3.8
- ≥ 49 -	7	8.8

Mean ± SD	± 9.03635	31.8000
• Gender		
- Male	33	41.3
- Female	47	58.8
• Marital status		
- Married	45	56.3
- Single	14	17.5
- Widow	15	18.8
- Divorced	6	7.5
• Qualifications		
- Secondary nursing diploma	4	5.0
- Specialty diploma	4	5.0
- Technical institute	1	1.3
- Bachelor	55	68.8
- Master	8	10.0
- PHD	8	10.0
• Years of experience in the Emergency department		
- Less than 1 year	4	5.0
- 1 – 2	25	31.3
- 3 – 5	41	51.3
- More than 5 years	10	12.5
• Received any information regarding emergency triage	80	100
• If yes Source of information		
- Academic study	15	18.8
- Mass Media	54	67.5
- Magazine / Journals / Books / Website / radio	5	6.3
- CNE programs / workshop /seminar / conference	6	7.5

• Occupational title		
- Junior nurse	6	7.5
- Senior nurse	65	81.3
- Nurse in charge	6	7.5
- Associate professor or professor	3	3.8
• Working shift		
- Day shift	10	12.5
- Night shift	10	12.5
- Day and night shift	60	75.0
• Additional Training and courses about triage application in the emergency		
- No	60	75.0
- Yes	20	25.0
• Type of emergency department (ED)		
- Adult ED	13	16.3
- Pediatric ED	12	15.0
- General ED (adult and children)	55	68.8
• The triage system applied in your hospital		
- Yes	65	81.2
- No	15	18.8
• Type of triage used at your ER		
- Australian Triage Scale (ATS),	5	6.3
- Manchester Triage System (MTA)	10	12.5
- Emergency Severity Index (ESI)	15	18.8
- Canadian Emergency Department Triage and Acuity scales (CTAS)	50	62.5

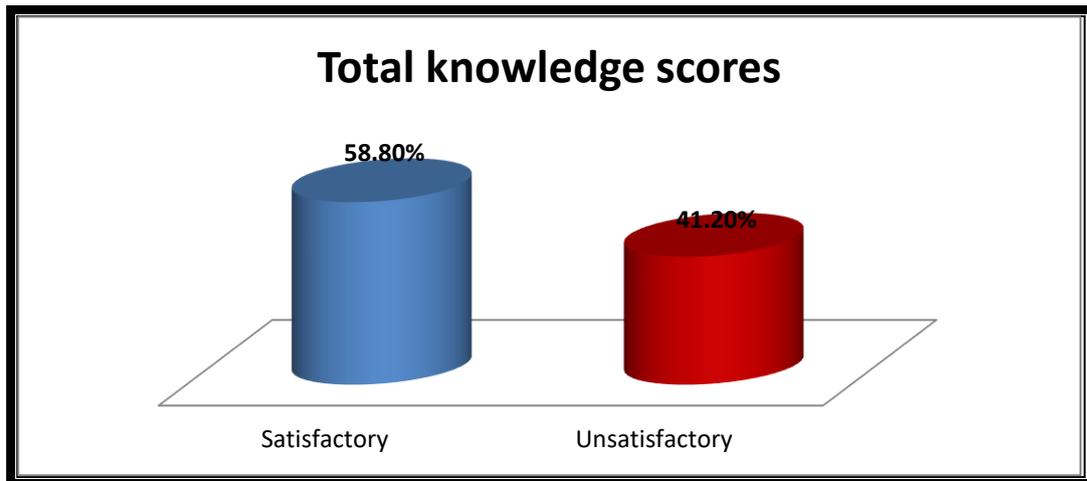


Figure (1): Percentage distribution of total knowledge scores and level among the nursing Staff regarding triage application in the emergency department, (N=80).

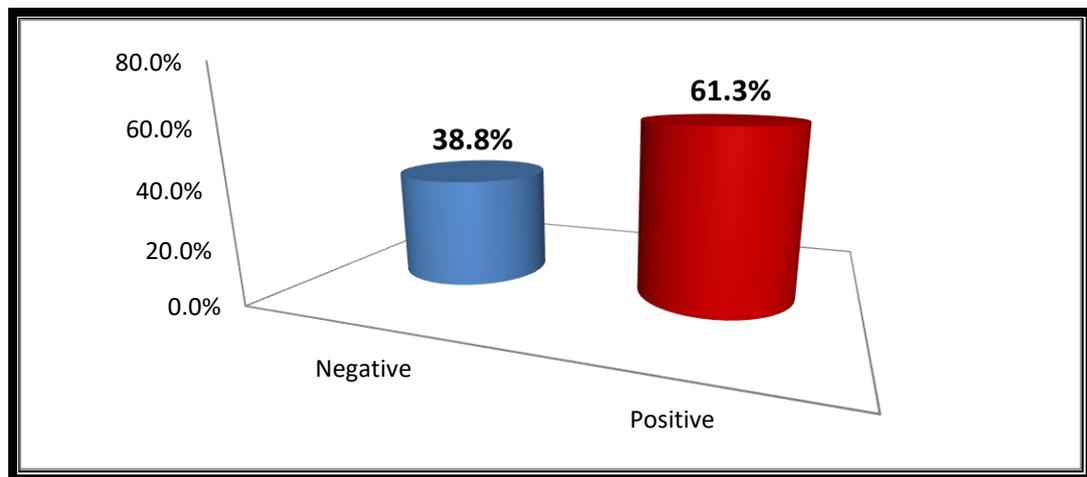


Figure (2): Percentage distribution of total perception scores and level among the nursing staff regarding triage application in the emergency department, (N=80).

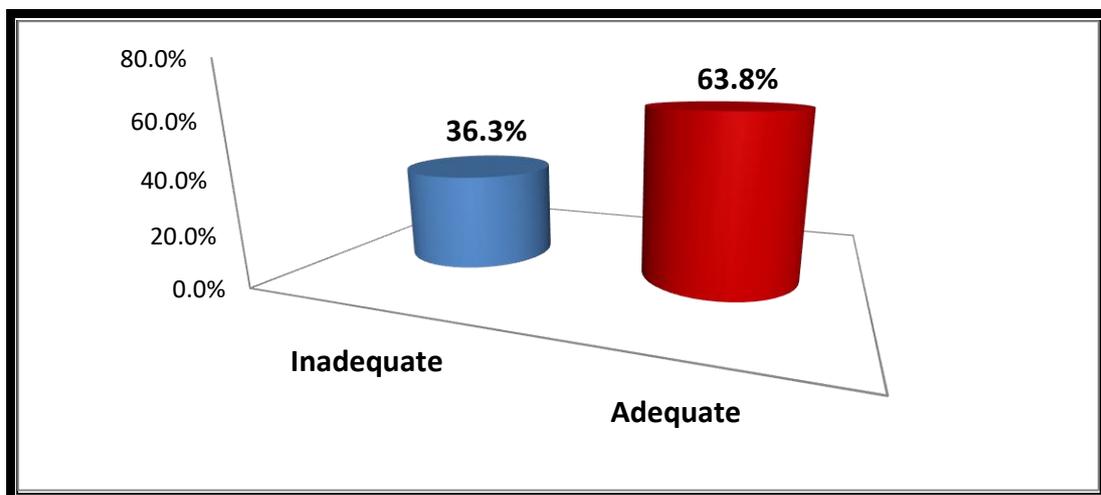


Figure (3): Percentage distribution of total reported practices scores and level among the nurses regarding triage application in the emergency department, (N=80).

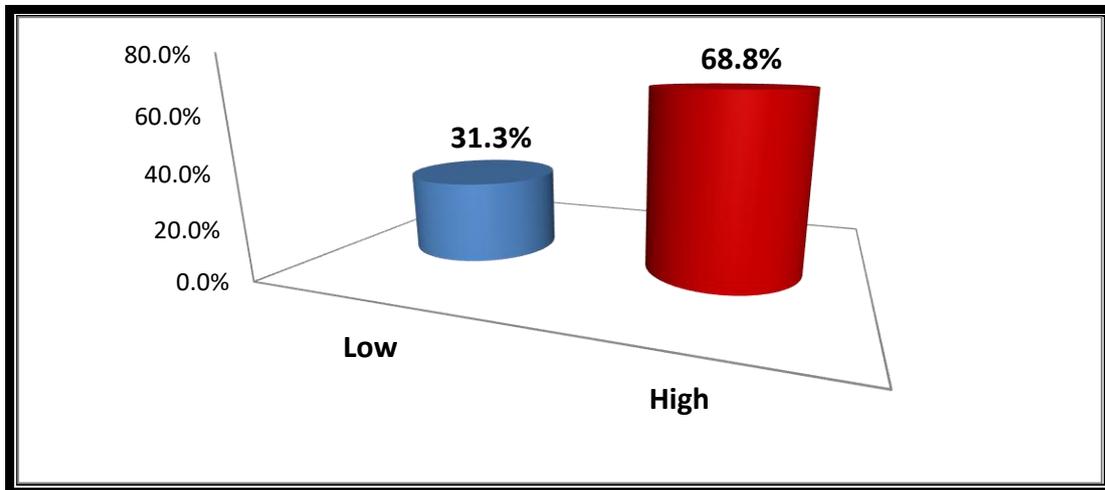


Figure (4): Percentage distribution of total level of studied nurses' satisfaction regarding triage application in the emergency department, (N=80).

Table (2): correlation between total level of knowledge, total level of reported practices, staff's perception and total level of staff's satisfaction of the studied nurses regarding triage application in the emergency department, (n=80).

Variables	Total knowledge level	
	r	P
➤ Total level perception	0.6 81	0.000*
➤ Total level practices	0.8 74	0.000*
➤ Total level satisfaction	0.8 25	0.000*

*Significant (P<0.05)

r= Pearson Correlation Coefficient

Discussion:

Nurses, who play a key role in triage application, should be sufficiently prepared and have good knowledge that enhances the triage nurse's adequate perception and positive satisfaction regarding triage application in the emergency department. So, this study was conducted to assess the perception and satisfaction of nursing staff regarding triage application in the emergency department (AlMarzooq, 2020).

Part (I): Demographic characteristics of the studied subjected

Regarding demographic characteristics among the studied nursing personnel, the present study illustrates that more than half of the age of studied nursing personnel were between 30 - and 39 years old with a mean age of 31.8000 ± 9.03635 . And more than two-thirds of them had a bachelor's degree while the minority had a technical institute. Also, more than half of the studied nursing personnel were female. This finding goes on the same line as **Phukubye et al., (2021)** who studied strategies to enhance knowledge and practical skills of triage amongst nurses working in the emergency departments of rural hospitals in South Africa and indicated in their study the majority of studied nurses' personnel was between 30 – 40 years' old and female.

This finding is in identical line with **Elgazzar, (2021)** who studied knowledge of triage and its correlated actors among emergency department nurses working in the emergency department (ED) at Burridah central hospital in the Qassim region of Saudi Arabia and found more than two-thirds of females and more than half of the study nurses were married, and more than two-thirds of the study nurses had a bachelor's level of education. On the other hand, the study finding was incompatible with the result published in the Egyptian Journal of Health Care and carried out at El-Fayoum University Hospital's emergency departments by **Mohamed et al., (2022)** and found that more than half of nurses had nursing technical institutes

From the researcher's point of view, this reflects the male-to-female enrollment ratio in nursing colleges at the majority of Egyptian universities reflects the gender distribution in the nursing profession, which is female. This information sheds light on the demographics of the field and can be useful for those seeking to understand trends in healthcare education and the workforce.

Concerning years of experience in the field of nursing, more than half of them worked for 3–5 years. The study finding was in the same line with **Sharif et al., (2019)** who conducted a study entitled “Evaluation of Nurses’ Performance Regarding Personal Protective Equipment at Rania Teaching Hospital” and found that more than half of nurses had experience less than 5 years. On the other hand, this result was in disagreement with **Krein et al., (2018)** who conducted a study entitled “Identification and characterization of failures in infectious agent transmission precaution practices in hospitals”, this qualitative study involved direct observation occurred in the medical and/or surgical units and intensive care units at an academic medical center and a Veterans Affairs hospital, as well as the emergency department of the university hospital and found that more than half of nurses had experienced more than 5 years.

Regarding marital status and occupational title, more than half of them were married while less than one quadrant of them were single and the majority of the studied nurses were senior nurses. The finding from the current study agrees with a study conducted by **Olsson et al., (2022)** when studying educational intervention in

triage with the Swedish triage scale RETTS© at two universities students undergoing education in emergency care, with a focus on specialist nurse students in ambulance and emergency care.

This result was accordance with **Lim et al., (2019)** who conducted a study entitled “Association between Hospital Nurses’ perception of patient safety management and standard precaution adherence, in a cross-sectional descriptive study, a convenience sample of nurses was recruited from a university-affiliated teaching hospital in Seoul, Korea”, and found that more than one third of nurses were single. In contrast.

Regarding additional training and courses about triage application in the emergency, about three-quarters of them did not receive additional training and courses. This result comes in line with **Sarbay et al., (2023)** who studied the performance of emergency triage prediction of an open access natural language processing-based Chabot application (Chat GPT): A preliminary, scenario-based cross-sectional study and found that the majority of them were not attend training courses about triage.

This result was accordance with **Marey et al., (2020)** who conducted a study entitled “Efficacy of Implementation Management program about Infection Control practices for Nursing Staff” in all departments in Tanta University Emergency Hospital and found that more than half of them were not attend training courses about infection control. On the other hand, this result agreed with **Berning et al., (2020)** who conducted a study entitled “Interventions to improve older adults' Emergency Department patient experience: A systematic review” and found that half of the studied nurses were attend training courses about infection control.

Part (II): Nurses' knowledge regarding triage application in the emergency department

Regarding total knowledge level of the studied nursing staff regarding triage application in the emergency department, the present study clarifies that more than half of the studied nurses had satisfactory level of knowledge regarding triage application in the emergency department. This result come in the line with **Malak et al., (2022)** who study knowledge, skills, and practices of triage among emergency nurses in Jordan and revealed that the majority of nurses had sufficient knowledge of triage, had moderate triage skills, and demonstrated good triage practices.

On other hand, the study finding was incongruent with the study result conducted by **Al-Metyazidy et al., (2019)** who mentioned that relationship between nurses’ knowledge, practice and accuracy of the patients’ triage acuity level in the emergency department in the emergency department at Al-Menshawey General Hospitals, Tanta, Egypt, and illustrated that all nurses had poor total knowledge about triage.

From the researcher's point of view, this finding was due to more than half of them being worked for 3–5 years old, all the nurses' receiving information regarding triage, and more than two-thirds of them receiving information from Mass Media. In addition, the majority of the studied nurses were senior nurses.

The researcher’s point of view is supported by **AlMarzooq, (2020)** who mentioned that with regards to training courses, three-quarters of KFHU nurses had advanced cardiac life support (ACLS) courses and half of DMC studied participants had triage courses. It was observed that training courses were statistically significant

among ED nurses. Similarly, **Pouraghaei et al., (2022)** reported that holding training courses regarding the significance, necessity, and procedure of triage has a great influence on improving the knowledge and performance of environmental management systems (EMS) employees in an interventional study about effectiveness of applying tactical combat casualty are guidelines on paramedic's knowledges.

From the researcher's point of view, this study indicates that a considerable number of nurses possess the necessary knowledge to perform triage effectively in emergency situations. However, it also indicates that there is still room for improvement, given that less than half of the nurses had adequate knowledge. This research underscores the significance of continuous evaluation and upgrading of nurses' knowledge and training in triage procedures. Triage plays a crucial role in identifying and prioritizing patients based on the severity of their condition, ensuring timely and appropriate care. Healthcare institutions can ensure that their emergency departments are well-equipped to handle diverse and complicated cases by identifying areas where nurses may need further training or support. By providing continued education and professional development programs, nurses can improve their triage skills, resulting in better patient outcomes and overall efficiency in the emergency department.

Part (III): Nurses' perception regarding triage application in the emergency department

Concerning total level of studied nurses' perception about triage application in the emergency department, the present study illustrates that more than two-thirds of studied nurses' adequate level of total perception about triage application in the emergency department, but more than one third of studied nurses' inadequate level of total perception about triage application in the emergency department.

The study finding was in the same line with the study results published by **Badawy et al., (2019)** who studied "Nurses Perception toward Implementation of an Emergency Department Triage System in Prince Mutaib bin Abd El Aziz Hospital in Al-Jouf Region" and reported that more than three quarters of studied nurses had adequate level of total perception about triage application in the emergency department.

On other hand, the study finding was inconsistent with the study result conducted with **Bakr & Badawi, (2022)** who studied "Effect of educational program on nurses' knowledge, attitudes and practices regarding triage in emergency department in omdurman military hospital, Sudan" and reported that the studied nurses had negative attitude before triage education compared to a significant improvement after triage educational program, with a statistically significant difference among the three- implementation phases (pre, post, and one month follow up).

From the researcher's point of view, in the present study a significant number of nurses have a good understanding of the triage process and its application in emergency settings. However, it is worth mentioning that there is still room for improvement as more than one-third of the nurses studied showed an inadequate level of perception regarding triage application. This indicates that there are knowledge gaps or misconceptions among a substantial portion of nurses that may impact the effectiveness of triage in emergency care.

Part (IV): Nurses' reported practice regarding triage application in the emergency department

Concerning total level of studied nurses' reported practice s about triage application in the emergency department, the present study illustrates that more than two-thirds of studied nurses had adequate level of total practices about triage application in the emergency department, but more than one third of studied nurses had inadequate level of total practices about triage application in the emergency department. In the same line, the study finding was compatible with the study result conducted by **AlShatarat et al., (2022)** who study triage knowledge and practice and associated factors among emergency department nurses employed in King Fahad Medical City (KFMC), Saudi Arabia, and illustrated that the studied nurses had higher levels of ED triage knowledge and practice.

From a researcher's perspective, the high levels of triage knowledge and practice among ED nurses could be attributed to the effective implementation of organizational policies that mandate continuous updates on their triage knowledge and skills. Additionally, regular audits, evaluations, and assessments aimed at improving the quality of care could enhance the triage knowledge and practice of nurses. Moreover, the availability of a valid and reliable triage system that participants used in their workplaces played a significant role in improving their knowledge and skills in performing triage accurately.

Part (V): Nurses' satisfaction regarding triage application in the emergency department

Regarding total level of studied nurses' satisfaction regarding triage application in the emergency department, the present study illustrates that more than two-thirds of studied nurses had positive satisfaction level about triage application in the emergency department, but more than one third of studied nurses had negative satisfaction level about triage application in the emergency department. The finding from the current study was agrees with a study conducted by **Khalifa et al., (2021)** who reported that the majority of study subjects saw that seeking out for a new challenge at work is the most affected factor, this may be due to the nurses' ambition to upgrade of themselves and their continuous desire to promote and increase their income, making it one of the most important factors by which the nurse determines that it remains in the hospital or is transferred to another hospital.

From a researcher's perspective, further analysis is needed to understand the reasons for the differences in satisfaction levels among nurses in emergency departments. Addressing the issues faced by nurses reporting negative satisfaction levels is crucial to improve the efficiency and effectiveness of triage. Engaging nurses in decision-making processes and seeking their feedback can help identify areas for improvement to enhance their satisfaction levels. This highlights the need for the continuous evaluation and improvement of triage applications to meet the needs and expectations of nurses, thereby enhancing the quality of care provided to patients.

The researcher's point of view is supported by **Javanmardnejad et al., (2021)** who study happiness, quality of working life, and job satisfaction among nurses working in emergency departments in Iran and reported that more analysis is needed to understand the varying satisfaction levels among emergency department nurses. Addressing nurses' concerns can improve triage.

Part (VI): Relation and correlational findings between variables under the study

Regarding correlation between total knowledge, practice perception, and satisfaction level regarding triage application in the emergency department among the studied nurses, the present study clarifies that, there was a positive strong highly statistically significant correlation between knowledge, practice perception, and satisfaction level regarding triage application in the emergency department among the studied nurses.

The study finding was in the same line with **Atigo & Yousif, (2021)** who study effectiveness of educational program on nurses' knowledge, attitudes and practices regarding triage in emergency department in Omdurman military hospital and illustrated that a higher knowledge, competent practice, and positive attitude that maintained at one month follow up with a statistically significant difference among the three phases of the study. So, it could be evidenced that triage education programs improved nurses 'performance regarding the application of triage for adult, pediatric, and obstetric emergency departments.

From a researcher's perspective, this may suggest that additional emergency nursing education on triage knowledge could improve triage practice. Future research can explore the role of conducting emergency nursing education programs on triage practice among ED nurses.

Finally, working in the emergency department can be extremely stressful and tense for nurses. They face a lot of pressure from urgent and critical cases, as well as from patients and their families. Without efficient processes and organization, the emergency department can easily become overwhelmed, especially during pandemics, disasters, and accidents. That is where triage comes in. Triage helps prioritize patients based on the urgency of their needs and ensures they receive the necessary treatment. It also helps to allocate resources judiciously, ensuring that patients are discharged to appropriate areas within a short waiting time. Since ED nurses often take on the role of triage, it is important that they have good knowledge and practice of triage concepts to perform their roles effectively. The present study found that emergency nurses had high levels of triage knowledge and practice. However, there were still some gaps and deficiencies in their knowledge and practice, which suggests that further education and training in emergency nursing is needed to improve their triage skills. Overall, triage plays a crucial role in ensuring that patients receive timely and appropriate care in the emergency department.

Conclusion:

Based on the results of the current study, it can be concluded that:

The results of the present study indicate that more than half of the nurses studied had a satisfactory level of knowledge, while more than two-thirds of them had adequate levels of total practice and perception. In addition, more than two-thirds of studied nurses reported positive satisfaction levels regarding the triage application in the emergency department. Furthermore, there was a strong and highly statistically significant positive correlation between knowledge, practice, perception, and satisfaction levels among the studied nurses regarding triage application in the emergency department.

Recommendation

In the light of results of this study, the following recommendations were suggested:

- Providing in-service educational training programs and upgrading courses based on evidence-based guidelines based on nurses' needs to improve their knowledge and practice related to triage application in the emergency department in both Arabic and English languages.
- Provide simplified and comprehensive educational guidelines, booklets, and websites in both English and Arabic languages about triage application in the emergency department and the role of nurses in triage application in the emergency department.
- Availability of updated learning facilities (books, journals, and protocols) recommended for the nurses in the emergency department for refreshment of their knowledge.
- Workshops, seminars, and Conferences should be arranged periodically and closely at a departmental level.

At the practical level:

- Implement a standardized triage system: It is recommended to adopt a standardized triage system that ensures consistency and accuracy in assessing patient acuity and prioritizing their care.
- Provide comprehensive training for triage nurses: Proper training should be provided to all triage nurses to ensure they have the necessary skills and knowledge to accurately assess and prioritize patients.
- Regularly review and update triage protocols: Triage protocols should be periodically reviewed and updated based on current research and evidence-based practices.
- Implement quality assurance measures: Regular audits and quality assurance programs should be established to monitor the performance of the triage system.

At the research level:

- Further study is needed to apply the guidelines with a larger sample size including structure and outcome guidelines in addition to process guidelines & evaluate its impact on nurses.
- Continued research and innovation in triage practices are recommended to identify best practices, explore new assessment tools or techniques, and adapt the triage process to changing patient needs or emerging healthcare challenges.
- Further studies should be conducted in different settings.

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