Effect of Educational Guidelines on Critical Care Nurses' Performance regarding Emergency Triage

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Abstract

Background: Providing critical care to trauma patients is the responsibility of emergency nurses worldwide, with the aim of lowering injury-related mortality and disability. Unprofessional triage might have unfavorable effects. A critical care nurse should be well educated and skilled in emergency nursing care, emergency triage, and decision-making. Triage training is a crucial component of emergency nursing education.. **Aim of study**: The study aimed to evaluate the effect of educational guidelines on critical care nurses' performance regarding emergency triage. **Design**: A Quasi-experimental (pre, post-test design) used to achieve the aim of this study. **Setting**: The study was conducted in emergency care unit at Sohag University Hospital. **Subjects**: A convenient sample of 50 nurses who included all available nurses in the previous mentioned setting. **Data collection tools**: I: Nurses' Knowledge Assessment Questionnaire which included; demographic characteristics, and nurses' knowledge regarding emergency triage, II- Nurses' Triage Competencies Observational Checklists, and III- Nurses' Attitude Measuring Scale. **Results**: The study showed that, there were improvements in nurses' knowledge, attitude, and practice mean scores regarding emergency triage with a statistically significant difference detected between nurses' knowledge mean scores post- educational guidelines than pre- educational guidelines at P value < 0.001. also, there was astatistically significant correlation between total knowledge and attitude scores, total knowledge, and practice scores, total practices, and attitude **regarding emergency triage pre and post- educational guidelines** at p<0.001. **Conclusion**: The study findings concluded that educational guidelines have a positive effect on critical care nurses' performance regarding emergency triage. Also, there was a significant positive correlation between total level of knowledge and level of practice and attitude. **Recommendation**: On-going and regular in –services educational programs regarding emergency triage should be included in the critical care nurses' performance.

Keywords: Emergency triage, Nurses' Performance, Educational guideline.

Introduction:

The triage system is the essential framework that uses a standard triage rating scale based on urgency to prioritize all incoming emergency patients. A triage system's objective is to guarantee that the standard of emergency care given aligns with clinical standards. The Canadian Triage & Acuity Score (CTAS) and the Manchester Triage Score (MTS) are two of the most used measures (**Joseph et al., 2023**). Triage systems, which provide a hierarchy of treatment based on clinical risk, are essential to how emergency services operate. Emergency services for adults and children must therefore use validated models and be implemented by appropriately qualified and accredited personnel (**Viana et al., 2023**).

Triage is a fundamental stage in effectively handling significant incidents. It is not distinct from bioethics, but it pursues the best interests of the entire community from a different angle. In order to make the optimal triage choice that will benefit all parties involved, the triage officer must consider several factors related to patients, resources, and the circumstances. There are no set criteria for this process (**Bakr & Badawi, 2022**). The emergency nurse must first have all the essential skills needed to work in the emergency room, including Pediatric Advanced Life Support and Basic Life Support (CPR). She also has to have finished a special triage program.

When the patient first attends for the initial evaluation, the nurse has the initial set of eyes to identify the signs of a patient in distress. An emergency nurse who is responsible for making triage judgments must therefore possess both a broad knowledge base and excellent physical assessment abilities. According to **Hu et al. (2022),** emergency nurses' performance is influenced by a variety of factors. These elements may be related to job regulations or nurses, thus human resources strategies should concentrate on addressing the issues that could have a detrimental impact on nurses' performance. Additionally, nurses' knowledge and abilities should be developed, therefore efforts should be focused on improving nurses' inventiveness, access to up-to-date information, and opportunities for ongoing education (**Ahmed et al., 2019).**

In emergency rooms, triage nurses are the main pillars. Their main responsibility is to determine the emergency patients' care priority. To carry out this function effectively, a triage nurse should possess the required education, training, and relevant experience. Triage techniques, decision-making, and emergency nursing interventions ought to be covered in this training (**Mirhaghi & Rudbari, 2021**). Despite the paucity of research on triage nurse education, the hospital at Kerman University of Medical Science recognized that nurses' performance and understanding in triage were lacking. These results were highlighted by **Mirhaghi & Rudbari (2021),** who discovered that triage nurses in hospitals in Sistani Baluchistan had comparable levels of knowledge. According to a previous Australian survey, 42% of emergency nurses were not exposed to any triage education.

These studies highlight concerns about the expertise and effectiveness of triage nurses in emergency rooms, as well as their inadequate and improper instruction in this crucial, life-saving area of patient care. All emergency room nurses must now complete triage training. (**Dadashzade et al., 2019**). In addition to lowering healthcare costs, emergency nurses can save many lives, prevent disabilities, and reduce complications by receiving the proper training in triage and by keeping the knowledgeable and experienced nurses on staff (**Lynch, 2019).** Therefore, proper triage training can increase the effectiveness of triage nurses and their confidence in acting more competently (**Cone & Murray, 2022).**

Emergency care starts with triage, which also establishes the course of emergency care. Patient outcomes are significantly impacted by the accuracy of the triage decision (**Considine et al., 2022).** It involves adopting additional clinical abilities to analyze the clinical status of patients and make prompt, accurate, and precise decisions that improve emergency department performance. Additionally, the triage subdivision's performance indicators have been used by the quality auditors to assess the emergency department's effectiveness (**Shawky, 2022).**

Significance of the study

Triage is a highly important activity and solves many problems of emergency services, such as overcrowding by patients and improves the quality of health outcomes cost-effectively (**Faheim et al., 2019**).The rate of ED visits was more than 400 per 1, 000 population; over 85 percent of ED visits involved patients who were treated and released from the ED (**Audrey et al., 2021)**. In emergency departments nurses make triage but without triage knowledge and with defect in performing process of triage (**Bahlibi et al., 2022).** Based on the pervious studied and observation during clinical experience of the investigator, nurses are in need to increase/improve their performance including KAS related to triage. If the triage is activated in the emergency department, it might lead to save life of a lot of patients using of minimum time and providing effective management for patients in priority. Therefore, this study was conducted to evaluate the effect of educational guidelines on critical care nurses' performance regarding emergency triage.

Aim of the Study:

The study aimed to evaluate the effect of educational guidelines on critical care nurses' performance regarding emergency triage through:-

1. Assessing critical care nurses' knowledge regarding emergency triage.
2. Assessing critical care nurses' practice regarding emergency triage.
3. Assessing critical care nurses' attitude regarding emergency triage.
4. Develop and implement educational guidelines for nurses regarding guidelines emergency triage based on their actual needs.

5. Determine the effect of educational guidelines on critical care nurses' performance regarding emergency triage

Research Hypothesis:

- Educational guidelines is expected to improve in critical care nurses' knowledge mean scores post-guidelines than pre- guidelines
- Educational guidelines is expected to improve in critical care nurses' practice post- guidelines than pre- guidelines

Subjects and Method:

Research design:

A Quasi-experimental (pre, post-test design) used to achieve the aim of this study

Setting:

The study was conducted in emergency care unit at Sohag University Hospital

Subject:

A convenient sample of 50 nurses who included all available nurses in the previous mentioned setting

Tools of data collection:

Data were collected using the following tools:-

Tool I: Nurses' Knowledge Assessment Questionnaire which included; demographic data, and nurses' knowledge regarding emergency triage

This tool was developed by the investigator in simple Arabic language based on extensive review of relevant and recent literatures (Ahmed & Ally, 2019, Duko, et al., 2019 and Faheim et al., 2019). It included the following parts:

• First part: It was concerned with demographic characteristics of the nurses under the study such as Age, sex, educational level, years of experience, and training courses.

• Second part: It was concerned with assessing of nurses' knowledge regarding emergency triage. It evaluates the key triage ideas. Ten open-ended questions were provided. They are: (1) definition of triage; (2) triage principles; (3) triage scale; (4) triage assessment and triage category allocation; (1) clinical presentation-based patient prioritization; (2) triage decision; (3) conditional risk factors; (2) objective data collection; (3) subjective data collection and communication; and (4) particular nursing interventions for different cases One inquiry (**Vasseur, 2001; Gilboy et al., 2012; & John & Sons, 2014**). This questionnaire distributed in the same form three times (pre, post-program implementation, and at one month's follow up) for the same group of nurses. The questionnaire Alpha Cronbach reliability test equal to 0.87.

Three score levels were assigned to each step: incorrect scored (1), correct and incomplete scored (2), and correct and complete scored (3). The questionnaire's overall score was 30 points, which were divided among the responses to the 10 questions. If the nurse's overall score was 85%, their level of knowledge was deemed satisfactory; if it was less than 85%, it was deemed unsatisfactory.

Tool II: - Nurses' Triage Competencies Observational Checklists:

It adopted from **Australian College for Emergency Medicine (2019), Elsayed et al., (2024), and Kevin et al., (2014**) to evaluate nurses' practices concerning triage process. It includes 55 statements arranged according to the following seven key competencies: Emergency assessment consists of nine steps: examination, primary assessment of medical risks, main complaint, medicine taken before to admission, medical history, five-minute triage, proper patient placement, privacy preservation, and psychological evaluation. Three steps in clinical decision making involve determining the patient's urgent medical needs, defining the course of treatment, and starting priority treatment. Triage interventions (20 steps) include secondary evaluation, prescription medication, priority-based treatment, vital sign monitoring, primary laboratory testing, first aid, basic life support, infection management, and additional lab work.

Documenting clinical data for the patient to be sent to the hospital of referral, testing, family communication, re-triaging, referral if needed, assisting with patient transport, etc. Evaluations, referrals to required specialties, communication with the emergency team, patients, and families, coordination with other hospital departments,

educating patients about their rights, services, rules, and hospital protocols, participating in staff and self-leadership development, and time management are all activities related to leadership and management (14 steps).

Scoring system:

There are two score levels for each step: completed was scored (2) and not completed scored (1). Emergency evaluation (18 points), Triage intervention (40 points), clinical decision-making (6 points), leadership and management activities (28 points), waiting room patient safety (6 points), and avoiding environmental hazard (12 points) are the separate scores for each subsection. Incompetent (less than 80% of the entire score) and competent (80% of the total score and above) are the two categories into which the total score is divided. 110 is the sum of the practice scores.

Tool III: -Nurses' Attitude regarding Triage Measuring Scale: - This tool was developed by the investigator after reviewing of the related recent literature (**Reisi et al., 2018**). It included 49 items aimed to assess nurses' attitude regarding emergency triage. It includes such statements as nurses' attitude toward triaging, patient care delay, patient reception, etc.

Scoring system

The grading score for the positive statements were scored agree=3, natural=2 and disagree=1. While, the score for the negative statements were scored agree= 1, natural=2 and disagree=3. These scores were summed and converted into a percentage score and categorized as follow:

• Positive if total score ≥ 85%. • Negative if total score < 85%.

Preparatory phase:

It includes reviewing the recent related literature and theoretical knowledge of various aspects of the study using books, articles, internet, periodicals, magazines in order to develop and modify the data collection tools.

Tool's validity and reliability:

•Validity:

The face and content validity was done through a panel of 7 experts from Medical Surgical and Critical Care Nursing Department, Faculty of Nursing, Sohag University. Their opinions were regarding comprehensiveness, accuracy, clarity, relevance and appropriateness of the study tools. No modifications were done based on expert's judgment and the final form was developed.

•Reliability:

Reliability of tools was tested statistically using Cronbach's Alpha which is a model of internal consistency and its normal range between 0 and 1 (value more than 0.5 acceptable reliability). Nurses' knowledge questionnaire was reliable at 0.81, observational checklist was reliable at 0.85 and nurse's attitude questionnaire was reliable at 0.81.

Pilot study:

The pilot study was carried out on a group of 10 nurses who represent 10% of study sample to test the clarity, applicability, feasibility and relevance of the study tools and to determine the needed time for the application of the tools. The subjects who were included in the pilot study were excluded from the study sample as minor modification was done after conducting the pilot study.

Ethical Considerations:

Approval to conduct the study was obtained from the ethical committee in the Faculty of Nursing, Sohag University before starting the study. The investigator explained and clarified the study aim and conducting way to the participants before taking the consent of participation. The investigator assured maintaining anonymity and confidentiality of data of subjects included in the study. The participants were informed about their right to withdraw from the study at any time without giving any reason.

Administrative design:

An official permission was obtained by submission of a formal letter issued from the Dean of Faculty of Nursing Sohag University to the director of each of the previously mentioned setting. An official agreement was obtained from Hospital Manager to get their approval to conduct the study.

Field of work:

A written informed consent was obtained from each participant prior to the data collection after explaining the aim of the study. Data collection started and completed within six months from the beginning of June 2023 to the end of December 2023. Data collection was done at the previous mentioned setting four days per weeks (from Sunday to Wednesday) in the morning shift (9 AM – 1 PM).

Implementation phase:

The study was conducted after receiving formal approval from the study settings' administration. The purpose, nature, significance, and expected results of the study have all been explained in detail. To test the feasibility of the study procedure, determine the time needed to complete each study tool, and assess the applicability of the study tools, a pilot study was conducted on five nurses, or 10% of the overall study population. Since there have been no changes made, the pilot study sample is then incorporated into the main sample. After obtaining formal approval from the previously specified settings, the investigation was carried out over a six-month period. The first questionnaire took an average of 35 minutes to complete, while the attitude Likert scale assessment questionnaire took 15 minutes, and 40 minutes for the observational checklists.

A knowledge, practice, and attitude assessment of the nurses marked the conclusion of the process. The theoretical content included topics such as communication, objective and subjective data collecting, risk factors for the patient's condition, triage decisions, clinical presentation-based patient prioritization, and suitable nursing actions.
The following were covered in the practical section: the primary competencies of emergency assessment, including visual assessment, determining critical urgency, and identifying the primary patient's complaint; the clinical decision-making competency, which includes tasks like identifying the patient's critical needs; and the triage intervention competencies, which include vital signs and triage level determination. In terms of management and leadership activities, the program addressed topics including emergency reception staff schedules during the shift and understanding of acceptable referrals. In the waiting area, patient safety include measures including maintaining a secure environment and preventing falls. Lastly, precautionary measures against environmental risks, including wearing protective clothes and following decontamination protocols, were also covered.
Five sessions were required to implement the educational standards in the settings outlined above. The first session started with nurses being split up into groups of ten, and an orientation to the educational guidelines and their purpose was given.

Every session began with an overview of the previous sessions' content and the goals of the current subject, keeping in mind the need for straightforward language appropriate for the degree of nursing expertise. A summary of the discussion's topics and other participants' comments were also included at the end of the session. Each session lasted between thirty and forty-five minutes, depending on the objectives of the group work and the needs of the nurses.

After three sessions of lectures and discussions covering the theoretical portion of the guideline, the practical portion was delivered. Two sessions were used, each consisting of a demonstration and re-demonstration utilizing role-playing, a simulator, actual objects, brainstorming, and debates. The researchers employed printed guidelines, posters, and PowerPoint presentations as informational tools. These materials were created and made available to nurses as a reference for usage once the implementation of the guidelines was complete.

The evaluation phase:

Using the same pre-test instruments, it is possible to assess the impact of educational guidelines on critical care nurses' performance in emergency triage by comparing changes in nurses' knowledge, practices, and attitudes about the guidelines one month after they were implemented.

Statistical analysis:

The "Statistical Package for the Social Science" (SPSS windows), version 19, is used on a personal computer to gather, score, total, arrange, tabulate, and analyze data. The range and mean ± SD are used to express numerical data. Frequency and percentage-based qualitative data,

Pearson correlation was used to assess for relationships between various numerical variables, as well as chi-square (X2). A P-value of less than 0.05 was regarded as significant, and a P-value of less than 0.001 as highly significant.

Results

Table (1): Illustrated that 60 % of nurses' age ranged from 20 to < 30 years old, with mean ± SD (31.55 ± 7.56). Regarding gender 22 % of nurses were males while 78 % of them were females. Concerning education, 46% of nurses graduated with a Diploma education. As nurses have years of experience, 60% of them had 1<5 years. Also, 90% of the nurses did not receive any form of **emergency triage** training.

Table (2): This table showed that there were improvements in nurses' knowledge mean scores regarding emergency triage with a statistically significant difference detected between nurses' knowledge mean scores post- educational guidelines than pre- educational guidelines at P value < 0.001.

Figure (1): Shows that the total knowledge level of the studied nurses has improved post-educational guidelines **about** emergency triage and shows also, that 20% of them had a satisfactory level of knowledge of pre-educational guidelines that improved to 100% post- educational guidelines.

Table (3): Illustrates that there is a highly statistically significant difference between nurses' practice pre and post- educational guidelines about emergency triage with a p-value <0.001.

Figure (2): Shows that 58% of the studied nurses had incompetent practice levels regarding emergency triage pre- educational guidelines that improved and became competent post- educational guidelines among (94%) the studied nurses.

Table (4): Illustrates that there is a highly statistically significant difference between nurses' attitude pre and post- educational guidelines about emergency triage with a p-value <0.001.

Figure (3): Shows that 48% of the studied nurses had negative attitude levels regarding emergency triage pre- educational guidelines that improved and became positive post- educational guidelines among (96%) the studied nurses.

Table (5): Revealed that there was astatistically significant correlation between total knowledge and attitude scores, total knowledge, and practice scores, total practices, and attitude **regarding emergency triage pre and post-educational guidelines** at p<0.001**.**

Table (1): Percentage distribution of demographic data among the studied critical care nurses (no=50).

ITEMS	No. (50)	%
Gender		
Male	11	22.0
Female	39	78.0
Age		
20 <30 year	30	60.0
30 <40 year	14	24.0
45 <65 year	6	16.0
Mean +SD	31.55 ± 7.56	
Educational Level		
Diploma education	19	38.0
Technician institute	23	46.0
Bachelor of Nursing	8	16.0
Years of experience		
Less than one year	5	10.0
1year to <5 year	30	60.0
More than 5 year	15	30.0
Attendance of previous training courses about emergency triage		
Yes	5	10.0
No	45	90.0

Table (2): Comparison between mean scores of critical care nurses' knowledge regarding emergency triage pre and post- educational guidelines

Nurse's knowledge	Pre educational guidelines	Post educational guidelines	t-test	P-value
Knowledge Mean Score	18.22±4.33	32.42±1.04	14.63	<0.001**

*- independent t-test ** Significant difference at p. value<0.01*

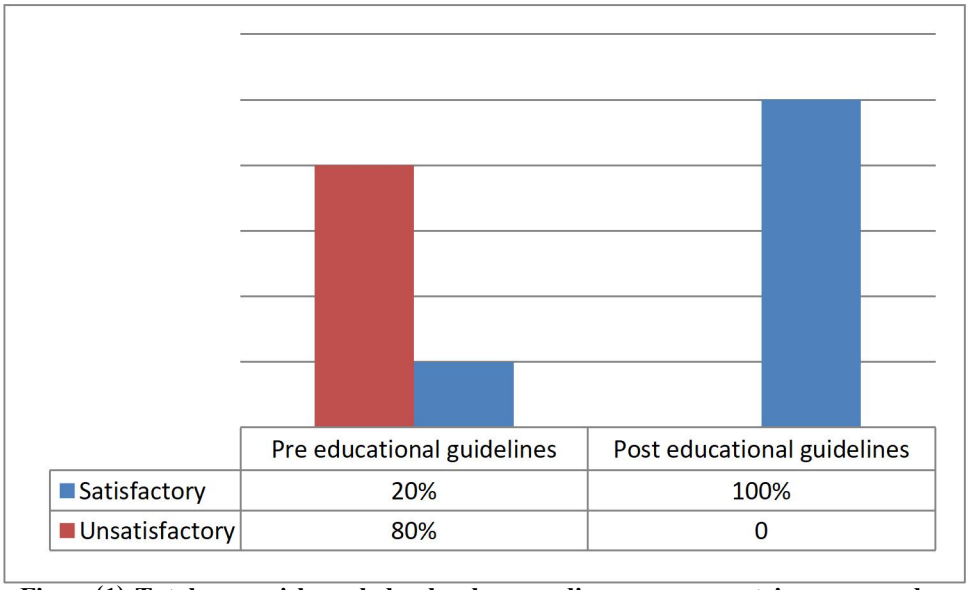

Figure (1) Total nurses' knowledge levels regarding emergency triage pre and post- social - and post- educational guidelines

Table (3): Comparison between mean scores of critical care nurses' practice regarding emergency triage pre and post- educational guidelines

Nurse's practice	Pre	post	T	P. value
Total practice score	50.33±4.66	100.33±7.22	89.67	<0.001**

*- Independent t-test ** Significant difference at p. value <0.01.*

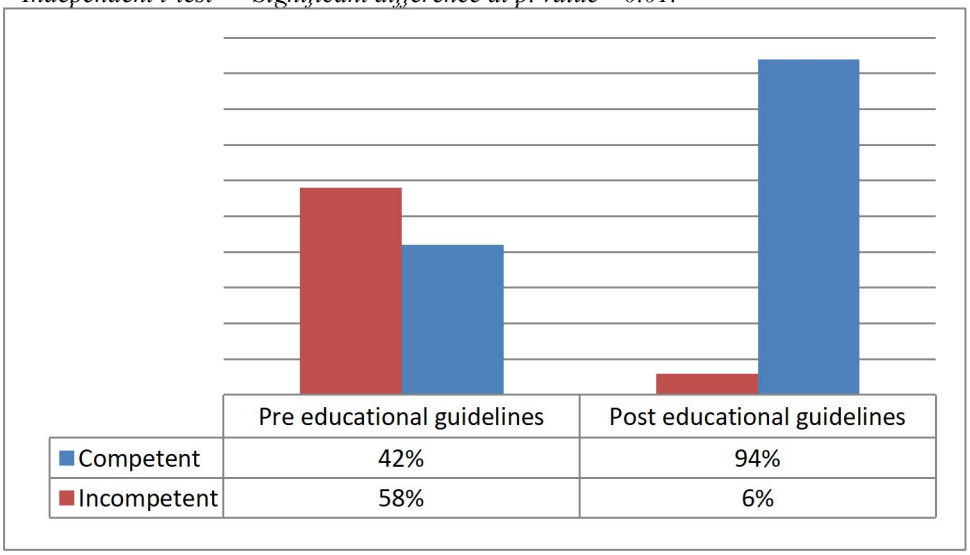

Figure (2): Total nurses' practice **levels regarding emergency triage pre and post- educational guidelines**

Table (4): Comparison between mean scores of critical care nurses' attitude **regarding emergency triage pre and post- educational guidelines**

Nurse's attitude	**Pre**	**post**	**T**	**P. value**
Total attitude **score**	66.45±6.34	120.55±4.89	23.67	<0.001**

*- Independent t-test ** Significant difference at p. value <0.01.*

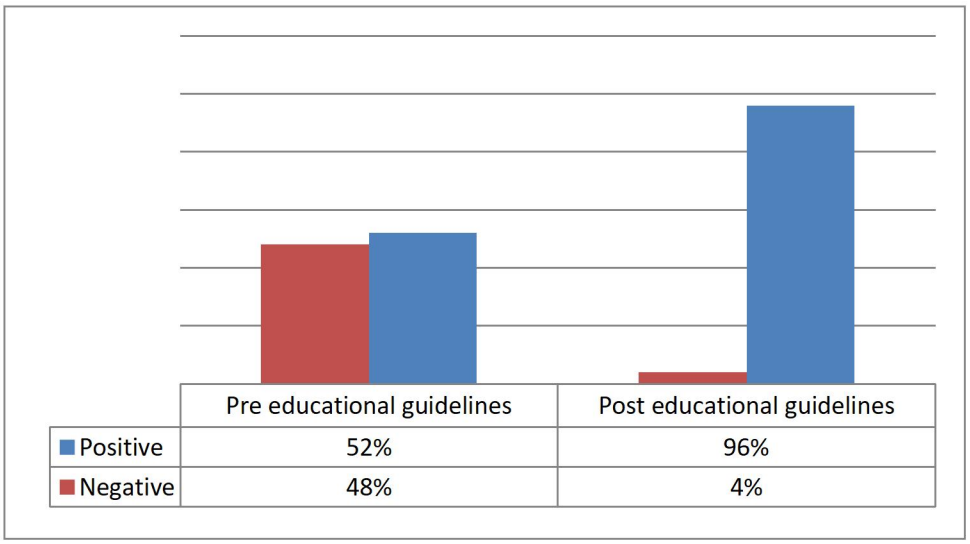

Figure (3): Total nurses' attitude **levels regarding emergency triage pre and post- educational guidelines**

Table (5): Correlation matrix of total knowledge, attitude, and practices scores regarding emergency triage pre and post- educational guidelines (n=50)

Items	Pre-test		Post-test	
	R	p	r	P
Knowledge VS practice	0.374**	<0.001*	0.307 **	<0.001*
Knowledge VS attitude	0.345*	0.005*	.706**	<0.001*
Practice VS attitude	.442**	<0.001*	604**	<0.001*

(*) Statistically significant at p<0.05 (**) statistically significant at p<0.01

Discussion:

For patient safety and the effective provision of emergency care, triage is an independent nursing function. The triage nurse needs to develop the ability to think critically in situations where the information at hand is insufficient, ambiguous, or incomplete (**Elsayed et al., 2024**). In order to improve emergency department nurses' effectiveness, education is essential. Thus, this study's objective was to determine how educational guidelines affected the abilities of critical care nurses in emergency triage.

The current study's findings about the age of nurses revealed that, with a mean age of 31.55 ± 7.56 years, three-fifths of the nurses were in the 20–30 age range. According to the investigator's perspective, these suggest that the nurses in this study were of the active-working age group and mature enough to handle the demands of their duties. Similar findings were made by **Gargamo et al. (2019)**, who stated that over two-thirds of participants were between the ages of 20 and 30.

This outcome was also in contrast to that of **Ariffin et al. (2023**), who used their study to evaluate the triage assessment knowledge and skills of nurses in a Saudi Arabian emergency department hospital. They discovered that a significant portion of the nurses in their study were between the ages of 30 and 40. Furthermore, **Elgazzar (2021**) reported the same conclusion as **Mustafa et al. (2019**), who discovered that over half of the nurses were over 30.

The findings of the current survey indicated that over three-quarters of nurses were female. According to **Phukubye et al. (2021**), over half

of the nurses in the study were female. This finding was consistent with their findings. Similar findings were made by **Gholami et al. (2023**), who carried out a study titled "Effect of triage training on nurses' practice and triage outcomes of patients with acute coronary syndrome" and revealed that a significant portion of the nurses employed in the study were female.

According to the findings of the current survey, less than half of nurses had a degree from a technical nursing institute. From the perspective of the researcher, this result reflects a specific circumstance in Egypt where there are more technical nurses than faculty-graduated peers. **Shawky et al. (2022**), who noted that the majority of the nurses in their study had completed secondary nursing school, corroborated this finding. This finding was comparable to that of **Kerie et al. (2018**), who discovered that around 50% of the sample under study had completed secondary and technical nursing school. **Duko et al. (2019**), But in contrast to these findings, it was noted that nearly two-thirds of the nurses had earned a bachelor's degree in nursing..

According to the results of the current study, three-fifths of the nurses had one to five years of experience, and over two-fifths of them were employed in a surgical emergency unit. According to the researcher, this outcome might be because over half of the nurses in the study were young—less than 30 years old. These findings ran counter to those of Kim & Kang (2019), who discovered that over half of the nurses in the study had less than three years of ED experience. Furthermore, according to **Elgazzar (2021),** nearly half of nurses had less than five years of experience.

Additionally, **Mukhtar & Fadlallah (2018**) conducted a study named "Nurse's knowledge regarding triage system at emergency departments in Public Hospital at Khartoum State" and found that over half of the nurses in the study had less than a year of experience working in an emergency department.

Regarding nurses' attendance at emergency triage courses, the current study's findings indicated that nearly all of them had not made it. This discovery, according to the investigator, might be the result of their unit's workload and lack of time for triage system-related courses. This finding was corroborated by **Phukubye et al. (2019**) in their study, "Assess Knowledge and Practices of Triage Amongst Nurses Working in the Emergency Departments of Rural Hospitals in Limpopo Province." They discovered that approximately 75% of the nurses working in the emergency departments of rural hospitals in the province lacked formal or in-service triage training, while a smaller percentage had triage training.

The findings of the current study indicate that nurses' knowledge mean scores on emergency triage improved, and a statistically significant difference was found between their knowledge mean scores before and after educational instructions. According to the investigator, this demonstrated the benefits of implementing educational guidelines that enhance nurses' knowledge.
This outcome supported **Abou Bakr's (2021**) assertion that most of the nurses in the study had inadequate knowledge levels before the program, however that after the program was implemented, this shifted to levels of knowledge that were satisfactory. **El-Guindy et al. (2022**) further support this, stating that the total triage knowledge of the nurses under study demonstrated a significant improvement after the posttest compared to the pretest evaluation.

As far as nurses' overall level of knowledge was concerned, the results of the current study showed that most of the nurses studied had inadequate knowledge of emergency triage according to the unit pre-educational guidelines. From the perspective of the investigator, this results could be the result of the study's settings not adhering to any rules or even allowing participation in training sessions on the concepts or use of triage system. This finding was supported by **Pouy et al., (2019),** showed that highly percentage of the studied nurses had inadequate knowledge on triage management." However, this result was in contrast to that of **Esmaealpour et al., (2022**) entitled “A Cross-Sectional Study to assess Nurses' Knowledge and Practice about InHospital Triage and found that level of knowledge regarding triage is moderate.

Additionally, those results validated **Moirangthem's (2019**) Findings showed that more than half of nurses knew about triage at an average level, which is corroborated by **Pouy et al.'s (2019**) finding that the majority of nurses lacked sufficient triage knowledge. However, the results of **Ina Lea et al. (2022**) showed that none of the nurses had low understanding of triage, while over half had intermediate knowledge and

over half had strong knowledge. These findings were not consistent with the current study. By pointing out that the nurses in that study had completed at least one training course, some of which were numerous courses, and had received training in triage, this can be explained. Furthermore, the findings of the current study differed slightly from those of **Esmaealpour et al. (2022),** who discovered that the degree of triage-related knowledge among nurses employed in emergency unit was moderate. In the same context **Al Shatarat et al (2022)** concluded that the nurses had overall high levels of triage knowledge.

A very statistically significant difference between nurses' practices before and after receiving emergency triage instruction was demonstrated by the outcomes of the current study. From the perspective of the investigator, this demonstrated the effectiveness of the application of instructional standards that aid in enhancing nurses' knowledge and practice level. This outcome was consistent with **Rahmati et al.'s (2023)** study at Fasa University of Medical Sciences' Vali Asr Hospital, which found that triage practice levels were higher following the intervention than they were prior to training and that there were statistically significant differences between program evaluation phases. **Haghdust et al. (2020**) also obtained similar results.

According to the current study's findings, with regard to emergency triage pre-educational guidelines, over half of the nurses under study practiced incompetently. However, after receiving education, the majority of the nurses under study improved and became competent. The lack of time for nurses to refresh their knowledge and abilities, time limits, lack of support from coworkers, and work responsibilities, particularly for those who are employed, could be the cause of this, according to the investigator. In addition, the majority of government hospitals lack enough supplies and equipment. Additionally, the emergency rooms of government hospitals are overcrowded, which increases the workload for nurses who care for this patient population and leads to inadequate nursing care. This finding emphasized the need for continuous education, particularly in such critical areas of care **Rahmati et al., (2023**).

The findings of a study by **El Guindy et al. (2021)** to "Enhance Nurse Knowledge and Practice Regarding Triage at Emergency Units" corroborated this conclusion. The study found that nurses' triage practices were subpar prior to triage instruction. This outcome was in contrast to that of **Khrawish & bu-Shahrour's (2021**) study, "A cross-sectional study to assess Jordanian Emergency Nurses' Triage knowledge, skills, and Associated Nurses related Factors," which concluded that Jordanian emergency nurses had an exceptionally high level of overall triage skills.

Regarding overall attitude, the findings of the present study demonstrated a highly statistically significant difference in nurses' attitudes before and after receiving emergency triage education. From the perspective of the researcher, this validated that the execution of the training guidelines met the study's goal, which includes raising nurses' level of practice and knowledge and enhancing their attitude. It's also possible that this result stems from the fact that triage education significantly improved nursing performance during the phases of implementing the guidelines.

According to the current study's findings, less than half of the nurses who were the subject of the study had a negative view toward emergency triage overall. One possible explanation for this could be that over half of the nurses in the study had inadequate knowledge and ineffective triage practices in emergency rooms, which led to a negative attitude toward triage. The study's hypothesis— These findings could confirm that post-triage education improved nurses' attitudes. **Abou Bakr (2021**) provided confirmation for this finding, stating that there was a highly statistically significant change in the nurses' attitudes before, during, and after the program, and that they were more optimistic one month later. Besides, **Habibinezhad et al (2021**) stated that there had been a statistically significant improvement in the knowledge and attitude of the nurses in the study compared to prior interactive training programs..

The results of the current study demonstrated a statistically significant relationship between total knowledge and attitude scores, total knowledge and practice scores, total practices, and attitude regarding emergency triage before and after educational guidelines had been implemented. In terms of emergency triage, this indicates that nurses with inadequate understanding were practicing incompetently. It would appear logical to draw the conclusion that nearly half of the individuals in this study had a total level of knowledge and practice.

The study hypothesis is further supported by this. Enhancing the findings of the present study, it is clear that training programs and education are essential for enhancing nurses' knowledge, practice, and attitude toward triage education.

The results supported those of **Habibinezhad et al. (2021)**, who asserted that competent nurses responded more favorably to triage. According to **Kassie et al. (2020**), a study participant's degree of knowledge was strongly associated to how positive their attitude was. Triage practice and knowledge were found to be significantly correlated by **Asgari et al. (2018**), who employed a study titled "Evaluating the disaster triage knowledge of nurses' personnel in Public Hospitals" to support their findings.
Concerning to correlation between level of attitude and level of practice, the present study result illustrated that, there was a significant positive correlation between total level of attitude and level of practice regarding emergency triage among the studied nurses. This result was supported with **Shaban & Allam, (2020)** who showed that the degree of nurses' triage-related practices and their attitude were positively correlated and showed that there was a positive correlation relationship between attitude and level of nurses' practices regarding to triage.

Concerning to correlation between level of knowledge and level of attitude, the current study result showed that there was a significant positive correlation between total level of knowledge and level of attitude regarding patients' triage in the emergency unit among the studied nurses. This result was contrasted with **Seda, (2020)** who found that there was statistically no significant relationship between knowledge and perception. In summary, the results of this study revealed that, there is a need to focus on development of nursing staff knowledge, skills and attitude, so effort should be directed towards enhancing quality of care among nurses. Nurses must have access to updated information, learning resources and continuous educational opportunities. The nurses must constantly seek better ways to improve their care to patients during applying triage process through acquiring knowledge and through implementing the established standards of care which must be up dated periodically.

Conclusion:

Based on the current study findings, the current study concluded that that educational guidelines has a positive effects on critical care nurses' performance regarding emergency triage**.** Also, there was a significant positive correlation between total level of knowledge and level of practice and attitude.

Recommendations:

Based on the current study findings the researchers recommended the following.

- **Providing** continuous in-service educational programs regarding emergency triage should be included in the critical care nurses' performance.
- To generalize the results, the study should be repeated with additional nurses and in various settings on the nurses' performance regarding emergency triage should be included in the critical care nurses' performance.

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