Practice of Nurses Caring for Patients with Accidental Chest Trauma during Emergency Period: Effect of Educational Guidelines

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Abstract

Background: The main factor in death globally is trauma. A chest injury of various severities, ranging from a minor rib fracture to a piercing heart injury or tracheobronchial disruption, affects about two thirds of the patients. **Aim:** Evaluate the effect of educational guidelines on nurses' practice level in caring patients with accidental chest trauma during emergency period. **Design:** A quasi-experimental design on one group with pre and post-test was utilized to conduct this study. **Setting:** The study was carried out in the Tanta University Emergency Hospital's emergency room(ER). **Subjects:** A convenience sample of all 60 nurses working in the ER at Tanta University Emergency Hospital, caring for patients with accidental chest trauma, from both sexes, varied ages, and willing to engage in the study. **Tools:** Data gathering utilized two instruments. I. Nurses' Self-Administered Questionnaire: Part 1. Demographics of nurses; knowledge and attitude level in caring of patients with accidental chest trauma during the emergency period in Part 2. II. Nurses` observational checklist used to determine their level of practice. **Results:** The current study found a highly statistically significant difference in the knowledge, practice, and attitude of nurses before and after the application of the educational guidelines. While there was no significant relation between nurses' attitudes (pre & post) and their level of education as P > 0.05, there was a significant relationship between nurses' educational level and their level of practice and knowledge following the implementation of the educational guidelines (P <0.001 & 0.004, respectively).**Conclusion:** The implementation of the educational guidelines has a positive effect on nurses' practice level in caring of patients with accidental chest trauma during emergency period throughout the program phases. These findings support the research hypothesis. **Recommendation:** Regular continuous educational program should be planned for nurses working in emergency departments at least every six months to improve nurses' practice and provide high-quality care for patients with accidental chest trauma.

Keywords: Trauma, educational guidelines, Emergency nursing, chest trauma, Thoracic injury.

Introduction

The leading cause of death on world is trauma. A chest injury affects about two thirds of the patients, ranging in severity from a minor rib fracture to a heart or tracheobronchial disruption. 90% of cases of blunt chest trauma require surgical intervention of some type, whereas only 10% of these cases involve blunt chest trauma **(Ludwig & Koryllos, 2017) and (Abdel Bary, Branscheid &Beshay, 2018).**

Thoracic injury is a common cause of mortality and major disability, and the leading cause of death from physical trauma after head and spinal cord injury **(Huber, Biberthaler et al., 2014).**

The typical management is expected to be multidisciplinary and should ideally begin at the scene of the accident. This should then be maintained during patient transportation to the emergency room, transportation to the operating room, and lastly in the intensive care unit. The key to reducing morbidity and mortality among this group of people is early management **(Ghoneim, et al., 2018).**

Assessing major thoracic injuries including tension pneumothorax, open pneumothorax, flail chest, pulmonary contusion, and severe hemothorax requires assessment of breathing as well as clinical examination of the thorax (respiratory motions and quality of respiration). To determine if a

tension pneumothorax is present, perform inspections, palpations, percussions, and preferably auscultation **(Ghoneim, et al., 2018).**

Maintaining and supporting the respiratory system must be the nurse's top priority when managing trauma patients. In order to intervene in the patient's care and help stabilize and maintain the patient's respiratory function, the nurse must be able to complete a primary survey quickly and effectively, identify the clinical signs of life-threatening thoracic injuries, and assess the patient. In addition to performing assessments, the nurse must be technically proficient and able to act swiftly and effectively **(Ursic & Curtis, 2010).**

For nurses working in the emergency room, educational practice guidelines should cover the following topics: knowledge, skills, and competencies to maintain quality emergency management of unstable and/or undiagnosed patients in a setting of constant movement, competing pressures, change in pace, and change in approach to accommodate the unique physical and psychosocial dynamics of each patient presentation**(Chu &Hsu, 2011).**

Significance of the study

According to the Central Agency for Public Mobilization and Statistics' most recent data from 2016, there were 14,548 road accidents in Egypt in 2015, which resulted in 6,203 fatalities, 19,325 injuries, and 19,116 damaged automobiles (CAPMAS.) **(Magdi , 2017).**

20% to 25% of trauma-related deaths are caused by thoracic injuries. Nearly 33% of all chest injuries are piercing thoracic injuries. With a mortality rate ranging from 15% to 77%, thoracic trauma brought on by blunt or penetrating damage is a leading cause of hospitalization worldwide**(Abdel Bary, Branscheid &Beshay,2018).**

Identifying professional strengths, weaknesses, knowledge, and skill gaps will also enable the development of learning objectives and career goals, so there was a strong need to evaluate the effect of educational guidelines on nurses' practice level in caring patients with accidental chest trauma during emergency period. This evaluation might assist to save costs by enhancing patient care, shortening hospital stays, and lowering complications.

Aim of the study

This study aimed to evaluate the effect of educational guidelines on nurses' practice level in caring patients with accidental chest trauma during emergency period through the following:

- Assess nurses' knowledge level in caring of patients with accidental chest trauma during emergency period.
- Assess nurses' practices level in caring of patients with accidental chest trauma during emergency period.
- Develop and implement educational guidelines in caring of patients with accidental chest trauma during emergency period
- Evaluate the effect of educational guidelines in caring of patients with accidental chest trauma during emergency period.

Research hypothesis:
The current study hypothesized that:

The educational guidelines would have a positive effect on nurses' practice level in caring of patients with accidental chest trauma during emergency period.

Subjects and Methods

Research design: A quasi-experimental (one group pre/posttest design) was utilized to conduct this study.

Setting: The study was conducted in the emergency department affiliated to Tanta University Emergency Hospital. The hospital consisted of six floors as following: the first floor including triage and resuscitation, radiology, blood bank, laboratory, pharmacy and infusions therapy unit which had 20 beds. The second floor including four operating rooms and 4 recovery wards which consisted of 40 beds divided into four wards, two for males and two for females in addition to 2 orthopaedic emergencies words one for males and the other for females which had 40 beds, 20 beds per each. The third floor belonged to internal medicine emergencies and toxicology including 2 wards.

Subjects: A Convenient Sample of all available nurses (60) who was working at the previously mentioned setting from both sex, different age and agree to participate in the study.

Tools of data collection:

Tool I: Nurses' Self-administered Questionnaire:

It was developed by the researcher in Arabic, and nurses filled it out. It included the following two parts:

Part 1: Nurses' demographic characteristics:

This part used to assess nurses' demographic characteristics which included 6 closed ended questions (age., gender., level of education., years. of experiences., marital status. and training. courses).

Part 2: Nurses' knowledge:

It was designed to assess the knowledge and attitude of nurses when providing emergency care to patients who had suffered an accidental chest injury. It was developed after researching relevant literature *((Pollak & Aehlert, 2018, Sanders, 2012, Brunner & Suddarth's, 2010 and ATLS 9th edition, 2018).* It was divided into six subgroups, each of which contained 60 multiple-choice questions (MCQ). Knowledge of the chest cavity's anatomy (5 questions), the mechanism of injury (4 questions), the primary assessment (15 questions), the secondary assessment (5 questions), the nursing care of specific chest trauma during the emergency period (25 questions), and nurses' attitudes toward chest trauma care (6 questions). The same tools were used in assessment pre implementation of the educational guidelines and in evaluation the effect of the educational guidelines post implementation.

Scoring system, every item on the nurses' knowledge assessment questionnaire received one point for the correct answer or agreement and zero points for the incorrect answer or disagreement. The total knowledge scores for nurses were determined for each subgroup, totaled, and then divided into satisfactory and unsatisfactory levels as follows:

- ≥ 85%was considered satisfactory level.
- < 85% was considered unsatisfactory level.
- The attitude questions were scored as positive or negative.

Tool II: Nurses' practice observational checklist:

Observational checklist for nurses: By using a direct observational technique, it was utilized to evaluate the level of practice that nurses had in providing emergency care to patients who had sustained accidental chest injuries. **The National Association of Emergency Medical Technicians NAMET, 2018**, was the source from which this instrument was adopted. It includes 35 skills that are represented by the following three subscales: **A. Patient assessment-related items:** 1. Nurses' initial or primary assessment of trauma victims (31 items) tests skills about life-threatening disorders in airway, breathing, disability, and circulation assessments and managements according ABCDE method 2. The nurses' secondary assessment (47 items) examined their proficiency in quick trauma patient assessment (head to toe assessment).

A. Items related to management of patients with chest trauma:

1. The assessment of the patient's chest by the nurses (11 items), which measured the assessment of the chest using four physical examination components: inspection, palpation, and auscultation as well as percussion.

2. The effectiveness of nurses in preparing and applying occlusive dressing for open pneumothorax was assessed using 9 items.

3. Nurses' performance in relation to needle decompression for tension pneumothorax (15 items), which assessed how nurses set up equipment, found the insertion site, and assessed the patient after the insertion.

Scoring system:

The check list received a score of 113 points overall. Each correctly done task received one point, while those that were skipped or done incorrectly received zero points. The overall level of nurses' psychomotor abilities was rated

as either poor (less than 85%) or satisfactory (more than 85%).

Operational design

The operational design includes preparatory phase, content validity and reliability, pilot study and field work.

Preparatory phase:

It was included reviewing of related literature and theoretical knowledge of various aspects of the study using books, articles, and periodicals to develop tools for data collection.

B) Tool validity and reliability:

- **Tool Validity:**

Tool validity was conducted to determine whether the tool covered the aim of the study or not. It was tested through panel of seven experts; three professors, three assistant professors and one lecturer of medical surgical nursing from Ain Shams University who review the tool to ensure its validity for comprehensiveness, accuracy, clarity and relevance.

- **Tool Reliability:**

Reliability of the developed tools was tested using alpha Cronbach's model which is a model of internal consistency and its normal range between 0 and 1(value more than 0.5 denote acceptable reliability).The reliability for these tools was 0.81.

C) Pilot study:

Six nurses (10% of the study population) participated in a pilot study to determine the feasibility of the research, assess the clarity of the questionnaires' design, and determine the amount of time required to complete the instrument. The six nurses who were deputed from bassun central hospital to the Emergency department connected with Tanta university emergency hospital in place of the nurses who participated in the pilot project were replaced by other nurses.

D) Field work:

The instructional guideline designed to be practical and theoretical in nature addressing knowledge necessary for nurses caring of

patients with accidental chest trauma during emergency period .Data were collected (from the beginning of January 2019 till end of June, 2019).

This study conducted through four consecutive phases: assessment, planning, implementation and evaluation. Data collection was done pre and post implementation of the educational guidelines.

Assessment phase:

During this step, the researcher met with each nurse who was a part of the study and gave a comprehensive description of the goal in order to obtain their verbal consent as well as their approval and cooperation. The researcher observed for all study subject to collect baseline data & the modified educational guidelines was developed based on a review of related literature and assessment tool (pretest).

Assesse nurses' level of (knowledge & practice) caring of patients with accidental chest trauma during emergency period by using questionnaire and nurses` observational checklist.

Planning and Implementation phase:

Determine the program strategies (timetable sessions, teaching methods, media used, learners' activities, evaluation methods, selecting the teaching place and the program finances).

The educational sessions were carried out in a hall at the emergency department for theoretical and practical sessions for 3 days during morning and afternoon shifts for every 6 nurses as individual or group according to their load of work. The researcher implemented the sessions of the educational guidelines according the time schedule which was prepared before (see tables, Supplemental Digital Content 1, which illustrates the sessions of the educational guidelines implementation).

Every educational session started by explaining the objective of the session then providing nurses with the knowledge related to the proposed topic. It had taken about 1 hour to be completed.

At the end of these sessions, the researcher emphasized the importance of the continuing training courses.

Evaluation phase

This phase was included evaluating the effect of educational guidelines on the nurse's level of (knowledge & practice) by comparing the results pre and post the educational guidelines implementation by using the same data collection tools and it was done Immediately after finishing the guidelines implementation.

Administrative and Ethical considerations:

The research was approved by the ethics committee in faculty of nursing, in Shams University, a written consent was obtained from nurses participating in the work after explaining the nature and purpose of the study.

The necessary approvals were obtained from the director of Tanta University Emergency Hospital.

Written consent was taken from nurses who agreed to participate in the research process. Permission was taken from the administrative personnel and the head nurses/supervisors of emergency department.

Nurses were assured data confidentiality, and the researchers initially introduced themselves to the study subjects and nurses were informed that their participation is voluntary and they can withdraw at any time from the work.

Statistical analysis:

The statistical software for social science (SPSS), version 22, was used to arrange, categorized, tabulate, and statistically analyze the obtained data in evaluate the change for nurses before and after receiving instructional guidance. Using numbers and percentages, data were shown in tables and charts. Percentage (%), mean and standard deviation (SD), Paired t-test, Chi-square (X2), ANOVA test, and Pearson coefficient(R) were all included in the statistical study. P 0.05* was used to determine statistical significance for the differences and relationships.

Results

Table 1 reveals that 83.3 % of the nurses were females. Regarding education, 53.3% of nurses have bachelor's degrees. In terms of experience years, 60% were between one and less than five years. In addition, 55% of the nurses lacked any formal training courses. 68.3% of nurses agreed that emergency trauma care protocols were present.

Fig. 1 shows that, 71.7% of nurses were between the ages of 20 and less than 40, while 28.3% were beyond the age of 40. In addition, the current study's nurses had a mean age of 33.18 6.45.

Table 2 illustrates that, there were high statistically significant differences between nurses' satisfactory level of total knowledge pre and post implementation of the educational guidelines at (P ≤ 0.001).

Table 3 shows that, in the primary survey, secondary survey, and patient evaluation with chest trauma, occlusive dressing, and needle decompression, there were high statistically significant differences between nurses' satisfactory levels of overall practice before and after the educational guidelines, with a clear improvement in these levels after implementation phase.

Table 4 reveals that, there were high statistically significant differences between nurses' attitudes toward nursing care of patients with chest trauma before and after the implementation of the educational guidelines, particularly during the emergency transport report of a victim and the community should have at least the most basic skills and knowledge about trauma care before hospital care, respectively (96.7, 91.7%).

Table 5 interprets that, the total knowledge and practice levels of nurses, finding that the satisfactory level was (13.3% & 21.7%) pre-implementation of the educational guidelines and improved to (76.7% & 83.3%) post-implementation, while the unsatisfactory level was (86.37%&78.3%) respectively pre-implementation of the educational guidelines. Additionally, the percentage of nurses who reported having a positive attitude before and after the educational program's implementation increased to 44.3% and 86.7%, respectively.

Table 6 shows that, there was no

significant relation between the years of experiences of nurses and their level of practice regarding knowledge (pre& post), practice (pre & post)and attitude (pre &post) implementation of the educational guidelines at $(P > 0.05)$.

Table (1): Number and percentage distribution of the studied nurses according to their demographic characteristics (N=60).

items		N	%
Gender	Male	10	16.7
	Female	50	83.3
Educational level	Secondary	7	11.7
	Technical	20	33.3
	Bachelor	32	53.3
	Post graduate	1	1.7
Years of Experience	1 – < 5	36	60
	5 – < 10	7	11.7
	≥ 10	17	28.3
Training courses	Yes	27	45
	No	33	55
Protocols of trauma care	Yes	41	68.3
	No	19	31.7

Fig. (1): Distribution of the studied nurses according their age group (N= 60).
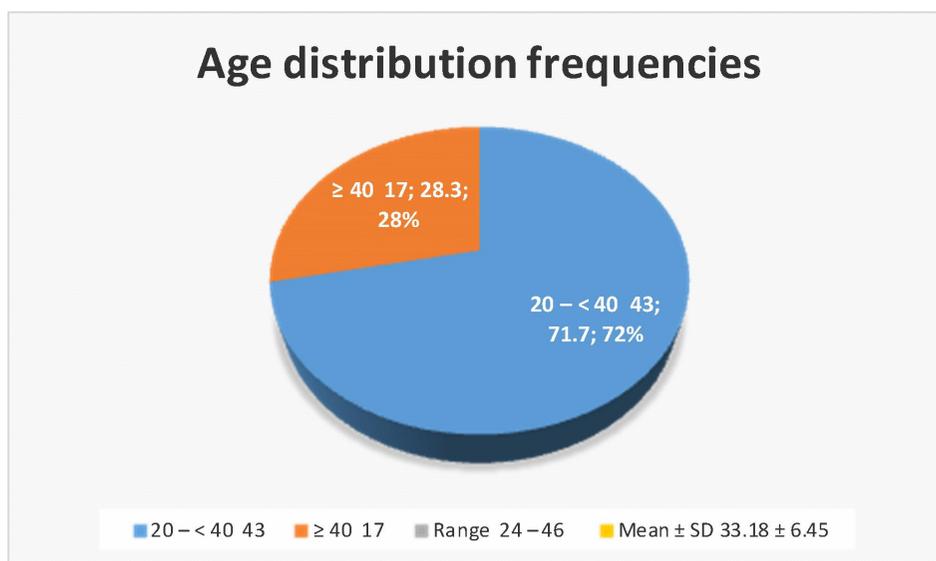
Table (2): Comparison of nurses' total level of knowledge pre- and post-implementation of educational guidelines (N=60).

Knowledge items	Pre				Post				X^2	P value
	Satisfactory		Unsatisfactory		Satisfactory		Unsatisfactory			
	N	%	N	%	N	%	N	%		
Anatomy of chest cavity	23	38.3	37	61.7	55	91.7	5	8.3	37.509	0.001**
Mechanism of injury	12	20	48	80	40	66.7	20	33.3	26.606	0.001**
Primary survey	5	8.3	55	91.7	46	76.7	14	23.3	57.323	0.001**
Secondary survey	9	15	51	85	47	78.3	12	21.7	48.348	0.001**
Nursing care of patient with chest trauma	8	13.3	52	86.7	44	73.3	16	26.7	43.982	0.001**

Not significant P> 0.05 (NS)* Significant P < 0.05 ** highly significant P < 0.001(HS).

Table (3): Comparison of nurses' level of practices pre- and post-implementation (N=60).

Items of Practice	Pre				Post				X^2	P value
	Satisfactory		Unsatisfactory		Satisfactory		Unsatisfactory			
	N	%	N	%	N	%	N	%		
Primary assessment	14	23.3	46	76.7	50	83.3	10	16.7	43.393	0.001**
Secondary assessment	0	0	60	100	46	76.7	14	23.3	74.595	0.001**
Evaluation of Patient with chest trauma	11	18.3	49	81.7	50	83.3	10	16.7	50.714	0.001**
Occlusive dressing	17	28.3	43	71.7	48	80	12	20	32.257	0.001**
Needle decompression	18	30	42	70	52	86.7	8	13.3	39.634	0.001**

Not significant P> 0.05 (NS)* Significant P < 0.05 ** highly significant P < 0.001(HS)

Table (4): Relation between total score of nurses' attitude regarding nursing care of patients with chest trauma pre and post implementation of the educational guidelines (n=60).

Attitude items	Pre				Post				X²	P value
	Positive (agree)		Negative (disagree)		Positive (agree)		Negative (disagree)			
	N	%	N	%	N	%	N	%		
Opinion on the victim's emergency transport report reporting chest trauma, if you view it as a medical-legal record.	33	55	27	45	58	96.7	2	3.3	28.420	0.001 **
Believe that everyone in the community should possess at least basic knowledge and abilities in rescue and first aid	20	33.3	40	66.7	55	91.7	5	8.3	43.556	0.001* *
Feel that comprehensive, specialized training should be offered to every employee in accident and emergency services so they can respond to emergencies with competence.	29	48.3	31	51.7	51	85	9	15	18.150	0.001* *
In an emergency, nurses must do extremely expensive and difficult procedures to saving a life.	23	38.3	37	61.7	48	80	12	20	21.558	0.001* *
Despite of providing emergency care to a victim in a proper way, in a life-threatening condition, nurses can't minimize the mortality rate happening due to delay ingoing to hospital.	34	56.7	26	43.3	52	86.7	8	13.3	13.297	0.001**
During providing emergency care for patients with chest injuries, using triage system affects the prognosis of the victim's condition.	16	26.7	44	73.3	47	78.3	13	21.7	32.114	0.001**

Not Significant. P> 0.05 (NS)* Significant P < 0.05 ** highly Significant. P < 0.001(HS)

Table (5): Relation between total satisfactory level of nurses' knowledge, attitude and practice regarding nursing care of patient with chest trauma during emergency period pre and post

implementation of the educational guidelines (N=60).

Variables	Pre				Post				X²	P value
	Satisfactory / positive		Unsatisfactory / negative		Satisfactory / positive		Unsatisfactory / negative			
	N	%	N	%	N	%	N	%		
Total knowledge	8	13.3	52	86.37	46	76.7	14	23.3	48.620	0.001**
Total Practice	13	21.7	47	78.3	50	83.3	10	16.7	45.748	0.001**
Total Attitude	26	43.3	34	56.7	52	86.7	8	13.3	24.762	0.001**

Not significant P> 0.05 (NS)* Significant P < 0.05 ** highly Significant P < 0.001(HS).

Table (6): Relation between nurses' knowledge, practice & attitude and years of experiences regarding nursing care of patient with chest trauma during emergency period pre and post implementation (n=60).

variables	Satisfied ≥ 85%						Unsatisfied < 85 %						X²	P value
	Years of Experience													
	1 – < 5		5 – < 10		≥ 10		1 – < 5		5 – < 10		≥ 10			
	N	%	N	%	N	%	N	%	N	%	N	%		
Practice pre	7	11.7	2	33.3	4	6.7	29	48.3	5	8.3	13	21.7	0.336	0.845
Practice post	32	53.3	5	8.3	13	21.7	4	6.7	2	3.3	4	6.7	2.091	0.352
Knowledge pre	6	10	0	0	2	3.3	30	50	7	11.7	15	25	1.459	0.482
Knowledge post	30	50	5	8.3	11	18.3	6	10	2	3.3	6	10	2.361	0.307
Attitude pre	18	30	2	3.3	6	10	18	30	5	8.3	11	18.3	1.720	0.423
Attitude post	30	50	7	11.7	15	25	6	10	0	0	2	3.3	1.459	0.482

Discussion

Trauma nursing is a complex and ever-changing, evidence-based field. It is well known that best patient outcomes are achieved when all providers involved are experts within their specialty. Working as an effective trauma nurse requires extensive experience in emergency and critical care concepts of nursing. Leaders in trauma nursing care should be recognized, utilized, and encouraged to grow within their field **Polovitch (2019)**.

The present study revealed that more than three quarters of the study sample were females nurses .the finding was in agreement with **Hassanin &Mohammed (2016)** who reported that ,the majority of the nurses who conducted a study titled " Effect of an Educational program for nurse's working at Mansoura University Hospitals on Chest Tube Complications' were females . The researcher suggested that, this result may be due to the high proportion of female nurses is most probably attributes to the fact that the study of Bachelor Sciences in Nursing (BSN) in the Egyptian Universities was exclusive for females only till few years ago, so the

profession of nursing in Egypt was mostly feminine.

Regarding the level of education, the present study revealed that more than half of nurses had bachelor degree. These results might be due to that the Faculty of Nursing at Tanta University started 1982, so the number of graduates up-till now is enough to be assigned in the critical care units as emergency and trauma units. This result was nearly in agreement with a study titled "Knowledge, attitude, and clinical skill of emergency medical technicians from Tehran emergency center in trauma exposure **Shakeri et al.,(2018)** which stated that (49.3%) of his study sample of nurses had bachelor's degree in nursing. This was in his ".While other study titled "The Association of Psychological Empowerment and Job Burnout in Operational Staff of Tehran Emergency Center" **Ghaniyoun et al., (2017)** stated that more than half of his study sample had technical degree.

Concerning years of experiences, the present study showed that, more than half nurses included in the study, their years of experience were between one and less than five years. This result was supported by **Wang et al., (2018)** a study conducted under the titled " Nurses' knowledge, attitudes and practices related to physical restraint: a cross-sectional study" in Hubei Province, China, in which (47.1 %) of the study sample their years of experience were from 1-5 years. In contrast, a study conducted under the title "Evaluation of the Nursing Management for Patients on Underwater Chest Drainage at Kenyatta National Hospital" **Chege et al.,(2018)** in Nairobi, Kenya, which showed that more than quarter of this study sample their years of experience were from 1-5 years.

Regarding training courses of trauma care, the present study found that more than half of nurses didn't have training courses. These results were in line with a study titled "The Effect of A Structured Training Program on Intensive Care Nurses Performance" in **Khartoum, Sudan. Chege et al., (2018)** which noted that the majority of the study subjects from ICU nurses' didn't received any specific course about mechanical ventilation. This result might due to continuous shifting of

nurses and overload roster .So they weren't have the opportunities to attend continuous training courses during working hours.

Regarding the trauma care protocol, the present study revealed that more than two thirds of the nurses confirmed the presence of the algorism of primary, secondary assessment and management of trauma patient. These results were in contrast with a study conducted under the title "The management of minor head trauma (GCS 15-13) across a Trauma Network "in Liverpool, UK. **Pulhorn et al., (2016)** which reported that more than half of his study subjects did not use any trauma care protocol .These results of the relevant study might be due to the separation between the emergency and trauma department from the anesthesia department since 6 years ago in the faculty of medicine which affiliated to Tanta University. So, the emergency and traumatology department declared the main role of emergency and trauma department through explaining specific algorism regarding trauma patient.

In relation to the age, the present study showed that most of the studied nurses were in their second and third decade. This result was supported by a study conducted under the title " Effect of an education program, risk assessment checklist and prevention protocol on violence against emergency department nurses: a single center before and after study" in Kurdistan **Jeffries, (2017)** which mentioned that the mean age of the participants was 30.1 ± 4.5 years.

Regarding the nurses' level of knowledge, the present study revealed that more than three quarters of nurses including in the study had a satisfactory level regarding the items related to the primary survey, secondary survey and nursing care of chest trauma. While almost all the nurses had a satisfactory level regarding anatomy of the chest cavity post implementation of the guidelines with significant differences between pre and post implementation of the educational guidelines about chest trauma nursing care during the emergency period. These results were in line with other study under the title "Disaster management: Emergency nursing and medical personnel's knowledge, attitude and practices

of the East Coast region hospitals of Malaysia**" Blackburn et al., (2019)** and **Kenny et al., (2016)** which reported that, more than 80% of the study subjects had a satisfactory level of knowledge post the implementation of a disaster management program in their study titled.

Also, another study conducted under the title " Trauma-informed education: Creating and pilot testing a nursing curriculum on trauma-informed care " in Michigan, USA**. Cannon, et al., (2020)** supported the current results which stated that, The content of the guidelines improves nursing students' knowledge and skills about Trauma Informed care (TIC) .On the other hand of these results, a previous study conducted under the title titled " Nurses' accuracy and self-perceived ability using the Emergency Severity Index triage tool: a cross-sectional study in four Swiss hospitals" in Basel, Switzerland. **Jordi, et al., (2015)** reported that 63.8% of nurses respond correctly regarding triage post training scenarios.

Concerning nurses' attitude and believe related to nursing care of a victim with chest trauma, the study finding showed positive attitude with a highly statistically significant differences among all items of nurses' attitude regarding nursing care of victim with chest trauma pre and post the implementation of the educational guidelines especially regarding the victim emergency transport report and also regarding the issue that the community should have at least the basic knowledge and skills about trauma care pre hospital care .These results were supported by a study conducted in this regard which stated that the majority of participant had a positive attitude post intervention of the workshops orientation **Hull,2019)**.

On the other side, a previous study conducted under the title " Trauma and Intensive Care Nursing Knowledge and Attitude of Foley Catheter Insertion and Maintenance" in Hollywood, Florida, USA **Shaver,et al.,(2018)**disagreed with the relevant results which revealed that the mean pre survey of the nurses' scores were slightly higher (91.3± 7.0) than the post survey score (89.8 ±

5.3%) with no significant difference between the participant's attitude after the guidelines implementation . In comparing of all items of nurses' practice level, the current study finding presented that, there were highly statistically significant differences between nurses' practice pre and post implementation of the educational guidelines.

Concerning the primary and secondary survey, that related to patient with chest trauma assessment, occlusive dressing, and needle decompression. Regarding needle decompression, most of the nurses had competence level of practice due to the implementation of the educational guidelines. In congruent with these finding , a study conducted this regard **Forest et al., (2018)** which compared between nurses' performance items as regarded to primary assessment, orthopedic assessment and pain management; it was found that, the triage nurses' performance was poor in the pre-intervention group in terms of primary and orthopedic assessments, but nurses performance improved in the post-intervention group. In addition, the nurses' performance related to pain management improved significantly in the post intervention group compared with the pre intervention group.

As regard to nurses' satisfactory level related to knowledge and practice in caring of patients with accidental chest trauma during emergency period, it was found that more than three quarters of the nurses had satisfactory level of knowledge and the majority of them get satisfactory level in practice post implementation of the educational guidelines with highly significant difference between the pre and post result.

These results were supported by a study conducted under the title " Educating Emergency Department Registered Nurses (EDRNs) in Screening, Brief Intervention, and Referral to Treatment (SBIRT): Changes in attitudes and knowledge over time" in, Pittsburgh, United States[28] which stated that , for role adequacy and role Support, nurses level of knowledge and practice was improved in the both levels from pre-training to post-training. In addition to, a previous study **Forest**

et al., (2018) reported that, participants showed significant improvement in knowledge and skills and the objective achieved post the implementation stage of the intervention.

Regarding the relation between nurses' years of experiences and the satisfactory level of knowledge, practice and attitude pre & post the implementation of the nursing guideline that related to nursing care of patients with accidental chest trauma during emergency period, the current study revealed that, there were no significant relation between the relevant variables pre and post implementation of the educational guidelines. These results were in accordance with **Mustafa et al., (2019)** and **Jordi et al., (2015)** who stated that, there was no discernable influence of nursing experience years, or years of triage experience upon the accuracy of Emergency Severity index (ESI) scoring of the nurses performance.

From the researcher view of point might be due to lack of refreshing courses that update nurse's knowledge and performance. Moreover, two thirds of the nurses included in the current study, had less than 5 years of experiences in the emergency department. In addition to, the achievement of emergency and trauma department that affiliated to Tanta University had been done since 6 years only. Also, **Etafa et al., (2018) and Axtman et al., (2019)** supported these findings, when they stated that work experiences had no effect on nurses' attitude regarding to pressure ulcer prevention.

From the researcher's point of view; this result reflected planned educational guidelines was effective in improvement of nurses' knowledge, attitude and practice regarding caring of patients with accidental chest trauma during emergency period and enables them to provide safe care for a patient with accidental chest trauma and proved the hypothesis of this study.

Conclusion

Based on the findings of the present study, it can be concluded that:

In conclusion, the results of the present study revealed that, the educational guidelines had a positive effect on nurses' practice level in caring of patients with accidental chest trauma during emergency period throughout the program phases. Based on this finding, the research hypothesis was fulfilled.

Recommendations

Based on the findings of the current study, the following recommendations can be suggested:

- A replication of present study can be conducted with a large sample.

- A further study to be carried out in different settings on a larger sample for a wider utilization of the educational guidelines, in order to achieve generalization of the results.

- Protocol related to nursing care of patients with accidental chest trauma during emergency period should be available in the emergency units and should be updated and revise periodically.

- Nurses' practice about nursing care of patients with accidental chest trauma during emergency period should be updated periodically through: Encouraging nurses to attend regularly national and international congresses, seminars, symposium and workshops about nursing care of patients with accidental chest trauma during emergency period.

- Plan periodically a continuous educational program about nursing care that should be offered to patients with accidental chest trauma during emergency period to nurses working in emergency department prior to work as an orientation program for the newly employed nurses and at least every six months for enhancing nurses' knowledge and practice to achieve high quality of care.

- Encourage nurses caring patients with accidental chest trauma during emergency period to attend regular formal in-service educational programs about chest trauma, triage system, and any other related topics to be able to provide comprehensive care for such group of patients.

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