

Nurses' Performance Regarding Advanced Care of Trauma Patients at Emergency Department

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Abstract: The nurse is involved in the advanced care of trauma patient from arrival in the emergency department to discharge from the hospital. **Aim:** This study aimed to assess nurses' performance regarding advanced Trauma care for patients at the emergency department. **Design:** Descriptive research design was utilized in this study. **Setting:** This study was carried out in the emergency department at El-Araby international Hospital. **Subjects:** All available nurses working in the emergency department at El-Araby Hospital (N=35). **Tools:** Three tools were used for data collection, (I) Nurses' Demographic Characteristics Sheet, (II) knowledge Self- Administered Assessment Questionnaire, (III) Nurses' practice observational checklist. **Results:** This study results revealed that 57.1% had unsatisfactory level of knowledge while 51.4% had incompetent level of practice regarding advanced trauma care and there was highly a statistical significant difference between nurses' level of Knowledge and their level of practice at $p=0.003^*$. **Conclusion:** it can be concluded that more than half of the studied nurses were having an unsatisfactory level regarding nurses' knowledge and practice and there was a statistical significant difference between nurses' Knowledge and practice. **Recommendations** The study recommended continuous educational programs should be planned on regular basis to nurses' caring of traumatic patients for enhancing nurses' knowledge and practice to achieve high quality of care.

Keywords: Nurses' performance, advanced care, Trauma.

1. INTRODUCTION

Traumatic injury has been recognized as a part of human experience since early civilization and many injuries were sustained as the result of their constant exposure to the raw elements of nature and frequent encounters with wild animals. Although the concept of traumatic injury has been around since the beginning of time, the incidence, magnitude, cause, mechanism, and treatment of traumatic injury have changed and it considered a major public health problem in the United States (McQuillan & Makic, 2020).

Trauma is a disease that exerts economic pressures on patients, families, the health care industry, and society as whole. Unintentional and intentional injury are the leading causes of death in the United States for persons aged 1-44. On an annual basis approximately 199,800 people die every year due to injury. Yearly millions of survivors are affected by injury, and many face life – long struggles with behavioral, physical, and financial challenges (Centers for Disease Control and Prevention, 2018).

According to the most current information from the World Health Organization (WHO) and the Centers for Disease Control (CDC), more than nine people die every minute from injuries or violence, and 5.8 million people from all ages and economic groups die every year from unintentional injuries and violence the burden of injury is even more

significant, accounting for 18% of the world's total diseases (**American College of Surgeons Committee on Trauma , 2017**). The primary goals of trauma management are to rapidly assess injuries, determine management priorities, and provide quality care services. A strategy to reduce waiting and stay times in the ED is the use of early triage to provide patients with early, safe, and quality specialized service (**Yazdannik, Dsatjerdi & Mohamadirizi, 2018**).

Timing is crucial when caring for an injured patient. An injured patient requires a systematic, rapid, and thorough assessment to identify and treat immediate life-threatening injuries. Performing an assessment using a logical, organized approach ensures that a rapid, thorough appraisal is completed, leading to the most beneficial outcomes possible for the patient. The integral components of the pre- hospital report must be communicated and recognized to allow for careful preparation, triage, and planning for the patient's arrival prior to the initial assessment being completed (**American College of Surgeons, 2017**).

The trauma patients poses challenges to health care system. In order to recognize and develop a keen appreciation for trauma nursing as a specialty field, one need to not only review things from a nursing perspective but also look at the historical events that guided the creation of trauma systems. The trauma systems approach to care led to the development of the clinical knowledge base that formed the foundation for the field of trauma nursing (**McQuillan et al., 2020**).

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 (**Society of Trauma Nurses, 2018**).

The coordination of patient care requires nurses with wide range and breadth of knowledge and skills. Trauma nurses must understand the significant impact that traumatic injury has on the patient, the patient' family, and society. They must be adept at sophisticated monitoring, caring, for the intense physiological needs, and be able to respond to the psychological and social demands of the patients. They also must be able to assist the family in coping with the stress and emotional devastation that accompany a sudden traumatic event (**Makic & Staubil, 2017**).

Aims of the study:

The aim of this study was to assess the nurses' performance regarding advanced care of Trauma patients at emergency department.

2. METHODOLOGY

Research design:

Descriptive research design was used for this study.

Setting:

This study was conducted at the emergency department in El- Araby Hospital at Elmenofia governorate in Egypt.

Subjects:

A convenience sample that consisted of all available staff nurses (no.35) from both gender, who were present at the beginning of the study and working at the emergency department in El-Araby Hospital. The staff nurses have different qualification (diploma nursing, technical institute, and bachelor degree), with different age and years of experiences.

Tools for data collection:

Data were collected using the following tools

Tool I: Nurses' Demographic Characteristics Sheet :

This tool was developed by the investigator to cover the personal data and the characteristics of the studied nurses as (age, gender, marital status, qualification, job categories, and years of nursing experience in the emergency department and attendance of trauma care training courses).

Tool II: knowledge Self- Administered Assessment Questionnaire : It was used to assess the nurses' knowledge regarding advanced trauma care in the emergency department, It consists of three parts:-

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The first part: Preparation and Triage Assessment Questionnaire: It was developed by the investigator based on the review of related literature (**Society of Trauma Nurses, 2018**) to assess the emergency nurses' level of knowledge regarding preparation and triage process for trauma patients.

The second part: Primary Survey Assessment Questionnaire: It was developed by the investigator based on the review of related literature (**Society of Trauma Nurses, 2018**) to assess the emergency nurses' level of knowledge regarding assessment and management Sequence of trauma patient.

The Third part: Secondary Survey Assessment Questionnaire: It was developed by the investigator based on the review of related literature (**Society of Trauma Nurses, 2018**) to assess the emergency nurses' level of knowledge regarding the Assessment and Management Sequence of trauma patient that include obtaining history about the mechanism of injury that can provides clues to anticipated injuries and complete physical examination.

Tool III: Nurses' practice observational Checklist: It was including three sections:

1st section: Preparation and Triage Observational Checklist: this tool was adapted from (**Student Course Manual for Advanced Trauma Care for Nurses, 2018**) to assess the actual nurses' practice in preparation and triage phase for receiving trauma patients, it consists of 12 items.

The second section: Primary Survey Observational Checklist: This tool was adapted from (**Student Course Manual for Advanced Trauma Care for Nurses, 2018**) to assess the actual nurses' practice during primary survey.

The third section: Secondary Survey Observational Checklist: This tool was adapted from (**Student Course Manual for Advanced Trauma Care for Nurses, 2018**) to assess the actual nurses' practice during secondary survey.it contains 2 main items as following; history taking and vital signs.

Scoring system

All questions was measured and divided by the number of questions to obtain the mean knowledge and practice of each nurse. Knowledge and practice below 80% was considered unsatisfactory and incompetent while those equal to or above 80% was considered satisfactory and incompetent .

Operational Design

The operational design of this study included preparatory phase, content validity, pilot study, and field work .

Preparatory Phase

It included reviews of current and post local and international related literatures, and theoretical knowledge of various aspects of the study using books, articles, and internet periodicals and magazines in order to develop the data collection tools .

Content Validity : It was ascertained by a Jury consisting of five experts of professors and lecturers from the medical surgical department; Faculty of nursing and from medicine, surgery and neurology department Faculty of Medicine, Helwan University who revised the tools for clarity, relevance, comprehensiveness, understanding and ease for implementation, according to their opinion modifications were applied .

Pilot study

Pilot study had been undertaken before starting the data collection phase. It was carried out on 10% of participants to test the feasibility and applicability of the second and third tools and to estimate the time needed to complete the tools according to the pilot study necessary modifications were done. The subjects included in the pilot study were excluded from the study sample

Administrative Design:

The present study was approved by the scientific research committee of the faculty of Nursing – Helwan University. Approval permission from the director of El Araby Hospital to conduct the study was obtained from the based on the

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official letter after explanation the aim and nature of the study. Informed consents were obtained from the nurses before the beginning of the study after explanation of the purpose and nature of the study.

Statistical analysis:

The data obtained were synthesized, analyzed, and presented in numbers; percentage in the form of tables, figures and diagram as required and suitable statistical tests were used to test the significance of results obtained using SPSS.

Limitations of the study:

- The small sample size and representation of one geographic area decrease the generalizability of the study findings.
- The related Arabic references are very limited, and no references in the hospitals.

Statistical design:

Data were analyzed using Statistical Program for Social Science (SPSS) version 26

Data were expressed as frequency and percentage.

The following tests were done:

- The **Chi Square** statistic is commonly used for testing relationships between categorical variables.
- **Cochran's Q test** is used to determine if there are differences on a dichotomous dependent variable e.g. ("pass" and "fail" & "low" and "high") between three or more related groups. It can be considered to be similar to the one-way repeated measures ANOVA, but for a dichotomous rather than a continuous dependent variable
- Spearman's is a non-parametric test used to measure the strength of association between two variables, where the value $r = 1$ means a perfect positive correlation and the value $r = -1$ means a perfect negative correlation.
- Probability (P-value)
 - P-value ≤ 0.05 was considered significant.
 - P-value ≤ 0.001 was considered as highly significant.
 - P-value > 0.05 was considered not significant.

3. RESULTS

- **Table 1** shows that there was slightly less than two thirds 65.7% of the studied nurses were between 20-30 years with mean age 28.51 ± 7.74 years. As well as slightly more than three quarters 77.1% were males. As regards to marital status majority of the studied nurses 71.4 % were married. More than half 57.1% had technical institute and less than one third 31.4% had bachelor of nursing. Concerning years of experience more than on third had experienced more than 10 years with mean 4.95 ± 3.86 . Adding to that more than half 54.3% attended training course and 73.7% from nurses who attended training courses made use of from courses.
- **Table 2** shows that, there is a statistically significant relation between total knowledge and total practice regarding advanced care of trauma patients among studied nurses at $p=0.003^*$.
- **Table 3** stated that, there is significant positive correlation between nurses' total knowledge and total practice for care of patients with advanced trauma.
- **Table 4** reveals that there is highly statistically significant relation between age, marital status, level of education, years of experience, training courses and nurses knowledge regarding triage ($\chi^2 = 21.6, P = .000$ & $\chi^2 = 16.25, P = .000$ & $\chi^2 = 19.88, P = .000$ & $\chi^2 = 28.55, P = .000$ & $\chi^2 = 24.82, P = .000$ respectively).
- **Table 5** clarifies that there is a highly statistically significant relation between age, marital status, level of education, years of experience, training courses and nurses' knowledge regarding primary survey ($\chi^2 = 30.9, P = .000$ & $\chi^2 = 23.69, P = .000$ & $\chi^2 = 27.29, P = .000$ & $\chi^2 = 31.03, P = .000$ & $\chi^2 = 17.41, P = .000$ respectively).

Table (1): Frequency and Percentage Distribution of Demographic Characteristics of the Studied Nurses (n=35)

Items	N	%
Age		
20-30	23	65.7
31-40	12	34.3
Mean ± SD	28.51 ± 7.74	
Sex		
Male	27	77.1
Female	8	22.9
Marital status		
Single	10	28.6
Married	25	71.4
Widow	0	0.0
Divorced	0	0.0
Level of education		
Diploma	4	11.4
Technical institute	20	57.1
Bachelor of nursing	11	31.4
Others	0.0	0.0
Years of experience		
Less than 5	11	31.4
6-10	10	28.6
More than 10	14	40.0
Mean ± SD	4.95 ± 3.86	
Training courses		
Yes	19	54.3
No	16	45.7
Benefits from courses n=19		
Yes	14	73.7
No	5	26.3

Table (2) Relation between total level of knowledge and total level of practice among studied nurses

Total Practice	Total Knowledge		x ²	P value
	Unsatisfactory	Satisfactory		
			8.57	0.003**
Incompetent	14 82.4%	3 17.6%		
Competent	6 33.3%	12 66.7%		

Not significant difference at P level > 0.05 *Significant ≤ 0.05 **highly Significant ≤ 0.001

Table (3) Relation between nurses knowledge regarding triage, preparation and sociodemographic characteristics of the studied

Items	Triage and preparation		χ ² P	χ ² P
	Unsatisfactory	Satisfactory		
Age				
20-30	19 82.6%	4 17.4%	χ ² = 21.6 P = .000**	χ ² = 7.30 P = .007*
	31-40	0 0.0%		
Sex				
Male	15	12	χ ² = .07	χ ² = .06

	55.6%	44.4%	P = .78	P = .79
Female	4	4		
	50.0%	50.0%		
Marital status				
Single	0	10	$\chi^2 =$	$\chi^2 = 5.60$
	0.0%	100.0%	16.25	P = .01*
Married	19	6	P =	
	76.0%	24.0%	.000**	
Level of education				
Diploma	4	0	$\chi^2 =$	$\chi^2 = 14.42$
	100.0%	0.0%	19.88	P = .001**
Technical institute	15	5	P =	
	75.0%	25.0%	.000**	
Bachelor of nursing	0	11		
	0.0%	100.0%		
Years of experience				
Less than 5	11	0	$\chi^2 =$	$\chi^2 = 30.54$
	100.0%	0.0%	28.55	P = .000**
6-10	8	2	P =	
	80.0%	20.0%	.000**	
More than 10	0	14		
	0.0%	100.0%		
Training courses				
Yes	3	16	$\chi^2 =$	$\chi^2 = 16.62$
	15.8%	84.2%	24.82	P = .000**
No	16	0	P =	
	100.0%	0.0%	.000**	
Benefits from courses n=19				
Yes	14	0	NA	$\chi^2 = 6.10$
	100.0%	0		P = .01*
No	5	0		
	100.0%	0		

Not significant difference at P level > 0.05 *Significant ≤ 0.05 **highly Significant ≤ 0.001

Table (4): Relation between emergency nurses level of knowledge regarding primary survey and sociodemographic characteristics of the studied nurses

Items	Primary survey		χ^2 P
	Unsatisfactory	Satisfactory	
Age\			
20-30	22	1	$\chi^2 =$
	95.7%	4.3%	30.9
31-40	0	12	P =
	0.0%	100.0%	.000**
Sex			
Male	18	9	$\chi^2 = .73$
	66.7%	33.3%	P = .39
Female	4	4	
	50.0%	50.0%	
Marital status			
Single	0	10	$\chi^2 =$
	0.0%	100.0%	23.69

Married	22	3	P = .000**
	88.0%	12.0%	
Level of education			
15.36Diploma	100.0%	0.0%	$\chi^2 =$ 27.29 P = .000**
	18	2	
Technical institute	90.0%	10.0%	
	0	11	
Bachelor of nursing	0.0%	100.0%	
	100.0%	0.0%	
Years of experience			
Less than 5	11	0	$\chi^2 =$ 31.03 P = .000**
	100.0%	0.0%	
6-10	10	0	
	100.0%	0.0%	
More than 10	1	13	
	7.1%	92.9%	
Training courses			
Yes	6	13	$\chi^2 =$ 17.41 P = .000**
	31.6%	68.4%	
No	16	0	
	100.0%	0.0%	
Benefits from courses n=19			
Yes	14		Na
	100.0%		
No	5		
	100.0%		

Not significant difference at P level > 0.05 *Significant ≤ 0.05 **highly Significant ≤ 0.001

Table (5): Correlation between total knowledge and total practice for care of patients with advanced trauma among studied nurses.

Total practice	Total knowledge	
	Spearman's coefficient	P
	.842**	.000**

4. DISCUSSION

Trauma is a leading cause of death and disability in developing countries. In – service training is a strategy for improving health-care providers' trauma-related knowledge and skills. Multidisciplinary education based on advanced trauma life support can reduce the waiting time for specialized care services, facilitate patient transfer from the Emergency department (ED) to from the Emergency department (ED) to the operating room, and shorten patient stay in the ED. It is also partially effective in alleviating overcrowding in the ED (Heydari, Mohamadirizi & Nasr-Esfahanai, 2020).

Part I: Demographic Characteristics of the Studied Nurses:

Regarding demographic characteristics of the studied nurses, the present study stated that there was slightly less than two thirds of the studied nurses were between twenty to thirty years with mean age 28.51 ± 7.74 years. As well as slightly more than three quarters were males. As regards to marital status majority were married. More than half had technical institute and less than one third had bachelor of nursing. Concerning years of experience more than on third had

experienced more than ten years. Adding to that more than half attended training course and from nurses who attended training courses made use of from courses.

This findings on the same line with **Ahmed, Taha & Zetton (2017)** who completed the study of “Nurses’ Knowledge and Practice of Trauma Patients during Golden Hours of Care” and reported that more than half of them were males, more than two third of the nurses were married but on the opposite line in some characteristics as mention that the majority of the nurses graduated from diploma nursing school, and more than two fifth of them had less than 5 years of experience in hospital, and slight more than half of them had years of experience in the ED more than 5 years.

This demographic findings in harmony with **Seliman et al., (2014)** who mentioned in the study entitled as “ Impact of a designed head trauma nursing management protocol on critical care nurses' knowledge and practices at emergency Hospital Mansoura University, Cairo, Egypt”, that the majority of nurses were in the age group (thirty years old).

This finding goes in the opposite line with **AL-gabril, Mohammed & Mehany (2019)** who stated that more about two third of the studied nurses were female, and Single, more than half of the nurses were in the qualification of Technical Institute of Nursing. This result may be due to the old belief that nursing is profession to female so most of nurses in Egypt are females.

These findings were in accordance with Maarouf (2012) in the study about “Nurses’ Performance for Patients with Traumatic Head Injury during Golden Hour, a study at Ain Shams University” and founded that slight near half of the subjects on the emergency department nurses had bachelor degree in addition to results of this study revealed that slight near three quarter of studied sample had training course about trauma patients, and more than four fifth of them gained benefits from it.

Part II: Nurses’ level of knowledge

The current study results clarify that, more than half of the studied nurses had un satisfactory level of knowledge regarding advanced care of trauma patients .Furthermore the current study results stated that there is highly a statistically significant difference regarding effect of nurses’ knowledge about preparation, triage, primary survey, secondary survey and total knowledge regarding advanced care of trauma patients at ($Q= 15.10, p=0.001$)

This result is congruent with **Yousef, Mohamed, Ali, & Ali (2018)** who clarified that the unsatisfactory level of nurses knowledge in the initial assessment might be due to the inadequate educational preparation level and lack of in-service training, on the same line **Carla, et al., (2018)** made a study about Nursing Conduct for Major Trauma Patients : Initial Care Provided at the Red Nursing Conduct for Major Trauma Patients A Brazilian study, with One hundred and forty-four nurses, emphasizes that nurses recognize that continuous education is an important tool that has a positive influence in the nursing care in a way that they could enhance their knowledge.

These findings are consistent with **Maarouf (2012)** who founded that near two third of the studied nurses had unsatisfactory practice regarding nursing management of patients with traumatic head injury during golden hour. This is contraindicated with **Collins (2015)** who reported in the study of “ Emergency Medical Support Units to Critical Care Transport Teams in Iraq” that total nurses' practice regarding nursing management of trauma patients in the emergency unit was satisfactory.

Concerning total nurses’ practice regarding advanced care of trauma patients, the present study demonstrated that there is highly a statistically significant difference regarding nurses’ practice for preparation, triage, primary survey, secondary survey and nurses’ total practice for care of advanced trauma patients at ($Q= 28.50, p=0.001$). Concerning correlation the present study show that, there is a statistically significant relation between nurses’ total knowledge and total practice for care of patients with advanced trauma at pre implementation of educational program ($x^2 =8.57, p=0.003^*$).

5. CONCLUSION

On the light of the current study results, it can be **concluded that** more than half of the studied nurses had unsatisfactory level of knowledge and incompetent level of practice regarding advanced trauma care and there is a statistically significant relation between nurses’ total knowledge and total practice for care of patients with advanced trauma at ($x^2 =8.57, p=0.003^*$).

6. RECOMMENDATION

Based upon the results of the current study, the following recommendations are suggested:

1. Designing checklist competence about advanced trauma care for nurses be used as a reference guide in their practice.
2. Creating advanced trauma care for nurses' algorithm to be applied in clinical practice.
3. Improve and update nurses' knowledge and skills about advanced trauma care through attending national and international conferences and workshops.
4. Developing system of periodical nurses' evaluation to determine strategies for updating their knowledge and enhancing their practice.

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