

## Nurses' Performance regarding Patients with Head Trauma during Golden Hour in Emergency Department

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### Abstract

**Background:** Head trauma is an important exporter of morbidity and mortality worldwide, with approximately 69 million affected individuals each year. The golden hour is period of time lasting for one hour or less following a traumatic injury during which there is argent need for prompting care of the patients to improve outcome and prevent death. The nurses' performance playing a vital role in reducing the morbidity and mortality of patients with head trauma. This study aimed to assess the level of nurses' performance regarding patients with head trauma during golden hour at emergency department in Zagazig University hospitals. **Research design:** A descriptive exploratory design was utilized to achieve the aim of this study. **Setting:** The study was conducted in ED at the emergency hospital, Zagazig University Hospitals. **Sample:** a convenience sample of all available nurses working in ED. **Tools of data collection:** Self-administered questionnaire, observational checklists, and nurses' attitude assessment likert type rating scale were used. **The study finding revealed that,** about 85.7 % of the studied nurses had unsatisfactory level of knowledge, while about 77.1% of the studied nurses had incompetent level of practices, also 91.4% of the studied nurses had negative attitude regarding patients with head trauma during a golden hour. **Conclusion:** It can be concluded that the studied nurses need special educational guidlines to improve nurses' performance regarding patients with head trauma during a golden hour. It is recommended to continuous in-service training programs for the purpose of refreshing, updating the nurse's knowledge and practice regarding patients with head trauma during golden hour.

**Key words:** Educational Guidlines. Golden Hour. Head Trauma. Nurses' Performance.

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**Introduction:**

A head trauma is a broad term that describes a vast array of injuries that occur to the scalp, skull, brain, and the underlying tissue and blood vessels in the head. It also commonly referred to as brain injury, or traumatic brain injury (TBI), depending on the extent of the head trauma. Head traumas are one of the most common causes of disability and death in adults. The injury can be as mild as a bump, bruise (contusion), or cut on the head, or can be moderate to severe in nature due to a concussion, deep cut or open wound, fractured skull bones, or from internal bleeding and damage to the brain (Ashley & Hovda, 2018).

According to the Centers for Disease Control (CDC), there were approximately 2.8 million traumatic head injury THI-related emergency department visits, hospitalizations, and deaths in the United States in 2013. The following CDC statistics also apply in the United States: THI was associated with approximately 56, 000 deaths in 2013. In 2012, emergency departments treated an estimated 329, 290 patient, aged 19 years or younger, for sports and recreation-related injuries in which concussion or THI was diagnosed (Kumar et al., 2018)

The leading causes of head injury in the civilian population are falls (43.7%) and motor vehicle collisions (MVCs) (21.5%). Common Causes of TBI falls (32.5%), motor vehicle crashes (17.3%), struck by or against events (16.5%) and assaults and interpersonal violence (10%) (Kumar & Mahapatra, (2017). Head injury is consisting of primary and secondary head injury. The primary injury occurs as a follow up of the initial physical insult the pattern and extent of destruction will a certified the nature, intensity, and duration of the impact. Compression and shearing forces may result in skull fracture, cerebral edema, contusions, intracranial hematoma, and diffuse brain injury. Microscopically there is cell wall trouble and increased membrane permeability disables ionic homeostasis (Sole et al., 2021).

Traumatic head injury can cause a variety of complications, health effects that are not THI themselves but that result from it. The risk of complications increases with the severity of the trauma however even mild traumatic head injury can result in disabilities that interfere with social interactions, employment, and everyday living. THI can cause a variety of problems including physical, cognitive, emotional, and behavioral complications. Although complications are rare, the risk increases with the severity of the trauma. Complications of THI include immediate seizures, hydrocephalus or post-traumatic ventricular enlargement, CSF leaks, infections, vascular injuries, cranial nerve injuries, pain, bed sores, multiple organ system failure in unconscious patients, and polytrauma (Mohamed, AbDELstar & Gendy, 2019).

The golden hour is 60 minutes following an accident treatment given during this time can be more effective than the same treatment given later. Since few traumas occurs in a hospital itself, the golden hour including the time it takes for help to arrive and for a trained professional to get the injured (Okada et al., 2020). Also, Cydulka et al, (2019) identify the Golden Hour as it

begins at the time of injury, and the goal is to get the patient to the operating room within 1 hour for the best chance of survival.

Nurses have an important and large role in the care of patients with head trauma. As an essential member of the interdisciplinary teams, nurses hold numerous roles and responsibilities to assist with patients' treatment and recovery, including assessing the patient; coordinating and communicating care; conducting technical and physical care; integrating prescribed therapies; providing emotional support to the patients and their families, and advocating and educating the patient and family. These roles and responsibilities of nurses depend on the severity and time of the patient's injuries, as the patient's condition changes, nurses modify their plane of care (Perrin & MacLeod, 2018).

### **Significance of the study:**

Head trauma or injury is a serious problem. The increased fragility of cerebral blood vessels, enlargement of the subdural space, and a decrease in the supportive tissue of the meninges all contribute to make the patient more vulnerable to intracranial bleeding particularly subdural hematoma (Heidenreich, 2017). Head injury is a significant source of morbidity and mortality worldwide, with approximately 69 million affected individuals each year (Zia, et al. 2019). Head injuries are unfortunate that Egypt occupies first place worldwide in the incidence of road accidents at a rate of 60 victims per day and that based on the latest statistics carried out by the Egyptian Central Agency for Mobilization and Statistic Egyptian Central Agency 2018 (Abd Elkader, Shehab & Ibrahim, 2020).

The nurses play a vital role in preventing or decreasing the disabilities that will be complications from head trauma. Therefore, this study will be carried out to evaluate nurses' performance regarding regarding head trauma patients at the golden hours and improve the quality of care, which in turn will improve victims' health outcome and reduce hospital stay of these patients.

### **Aim of the study**

The aim of the current was to assess nurses' performance regarding patients with head trauma during golden hour at emergency department in Zagazig University hospitals.

### **Research Questions:**

- What is the level of nurses' knowledge regarding patients with head trauma during golden hour?
- What is the level of nurses' practice regarding patients with head trauma during golden hour?
- What are the nurses' attitudes regarding patients with head trauma during golden hour?

A descriptive exploratory design was used to conduct this study, The current study was conducted in emergency department (ED) at the emergency hospital, Zagazig University Hospitals. The study sample included all the available nurses working in the above-mentioned setting (Total number of the subjects was 35 nurses).

#### **Tools of data collection:**

**Tool I-**A structured interview questionnaire was developed by the researcher based on literature review (Duchesne, Inaba & Ali Khan, 2018; Powell, 2018) to identify nurses' knowledge level and their needs, it is consisted of three parts:

**Part 1:** Demographic characteristics of nurses e.g. (age, sex, marital status, level of education ...etc)

**Part 2:** Nurses' Knowledge about head trauma covered four parts as the following: nurses' knowledge regarding head and scalp trauma, skull trauma, brain trauma, and complication of head trauma.

**Part 3:** Nurses' Knowledge regarding nursing care for head trauma patients during golden hour, it covered five parts as the following: receiving patients with head trauma in the ED, triage, primary assessment, secondary assessment, and CPR.

#### **Scoring System for Nurses' Knowledge:**

Scoring system related to the knowledge of the nurses in parts II, III was graded according to the items of interviewing self-administer tool. The answers were evaluated using model key answer prepared by the researcher. Each correct answer scored one grades and zero for incorrect answer. The total score was calculated for each nurse by sum the score items of questionnaire. The nurse had satisfactory level of knowledge when the total score equal or above 80%, and unsatisfactory when it below 80% based on statistical analysis.

**Tool II: An Observational Checklists (Appendix II):** Observational checklist was developed by the researcher based on literature review and opinions of expertise for content of validity. It included items about assessment of nurses' practice regarding to emergency physical assessment for head trauma patient based on primary and secondary surveys (DeWit, Stromberg H & Dallred, 2017; Lewis et al, 2017; Marmo and D'Arcy, 2018 and Ignatavicius et al, 2022). In addition, nursing care based on nursing assessment: inserting an oropharyngeal airway (Lynn, 2019), administering oxygen by mask (Harding et al, 2020), suctioning an endotracheal tube (Lynn, 2019), insertion of intravenous IV lines (Burton, Smith & Ludwing, 2018), care of Scalp injury (Potter et al, 2019), shock assessment (Roberts et al, 2019), cardiopulmonary resuscitation CPR (Potter et al, 2019), and answers were done and not done.

**Scoring system interpretation:** For observational checklist consisted of given score one for done step with correct way and score zero for not done and/or done incorrectly. The nurses had competent level of practice when the total score equal or above 80 % and incompetent if it below 80% based on statistical analysis.

**Tool III: Nurses' Attitude (Likert Scale):** It was developed by the researcher after reviewing the pertinent literature review (Abd El-Gawad, 2019). It covered five parts as the following: physical attitude, knowledge attitude, psychologic attitude, skills and training attitude, resources, and financial attitude.

**The Scoring System:** For attitude given score four for strongly agree and three for agree and two for disagree and one for strongly disagree. The nurse had positive level of attitude when the total score equal or above 80%, and negative when it below 80% based on statistical analysis.

#### **Administrative and ethical consideration:**

An official permission for data collection in Zagazig University was obtained from the hospital administrative personnel by the submission of a formal letter from the Dean of the faculty of Nursing Zagazig University explaining the aim of the study in order to obtain permission and help. At the interview, each subject was informed about the purpose, benefits of the study, and studied nurses were informed that participation is voluntary, and they have right to withdraw from the study at any time without given any reason. In addition, confidentiality, and anonymity of the subjects were assured through coding of all data. The researcher assured that the data collected will be confidential and would be used only to improve nurses' knowledge, practice and reinforcing positive attitude for the purpose of the study.

**Pilot study:** Was carried out in order to check and ensure the clarity, applicability, relevance and feasibility of the tools. For this study, the researcher selected seven (10%) nurses random to participate in the pilot testing of the questionnaire and checklist from emergency department and poisoning unit and not excluded from the study sample because of no modifications in the tools.

#### **Field work:**

Once the approval was granted to progress in the study, the researcher started to organize a schedule for collecting the data. The researcher visited study setting to be familiar with work process, time of work and observe nurses attending the study settings to a set schedule for data collection. The researcher used to go to the study setting for interviewing the nurses. The purpose of the study was explained to each nurse individually, and then the nurses were asked to participate in the study. Each nurse observed for 2 shifts at morning and afternoon then she will ask to fulfill the questionnaire sheet. As the researcher was observing nurses' practical skills about studied procedure. The time needed to complete the checklist varies between 30-45

minute. The fieldwork was executed over the period from March 2021 up to the end of August 2021. The researcher was available 2 day at Zagazig University hospital.

### **Content validity& Reliability:**

The tools were revised by a panel of seven experts from nursing staff which included one professor and two assistant professors and four lectures of medical surgical nursing that revised the tools content for clarity, relevance, comprehensiveness, and ease for implementation. All recommended modifications were done. Reliability was measured by Alpha Cronbach for knowledge questionnaire was 0.735. Reliability of practice checklist was 0.912 and attitude was 0.674.

### **Statistical analysis:**

All data were collected, tabulated, and statistically analyzed using IBM Corp. Released 2015. IBM SPSS Statistics for Windows, Version 23.0. Armonk, NY: IBM Corp... Quantitative data were expressed as the mean  $\pm$  SD & median (range), and qualitative data were expressed as & (percentage). Wilcoxon sign rank test was used to compare between paired of non-normally distributed variables. Percent of categorical variables were compared using, Chi square test or Fisher Exact test when appropriate. Pearson' correlation coefficient was calculated to assess relationship between various study variables, (+) sign indicate direct correlation & (-) sign indicate inverse correlation, also values near to 1 indicate strong correlation & values near 0 indicate weak correlation. Multiple linear regressions are a predictive analysis. Multiple linear regression is used to describe data and to explain the relationship between one dependent continues variable and one or more independent variables. All tests were two sided. p-value < 0.05 was considered statistically significant, p-value  $\geq$  0.05 was considered statistically insignificant.

### **Result:**

**Table (1)** Clarifies that more than half of studied nurses (57.1%) aged more than 25 years old with mean  $\pm$  SD (28.9 $\pm$ 6.6 year). Most of studied nurses were male (97%) and 60% were married. About three quarters of studied nurses come from rural area (71.4%), more than half of the studied nurses had technical institute degree (51.4%), more than half of studied nurses have less than five years' experience in hospital (54.3%), and three fifths of studied nurses have less than five years' experience in the ED (60%). Furthermore, only 37.1% of studied nurse had training course about head trauma. All the trained nurses reported that they gained benefited from training course (100%), and most of studied nurses wanted to be involved in another training course (92.3%).

**Table (2)** shows total nurses' knowledge regarding patients with head trauma during golden hour. The table reveals that majority (85.7%) of studied nurses had unsatisfactory knowledge level regarding patients with head trauma during golden hour with mean  $\pm$  SD (42.37 $\pm$ 17.83).

**Table (3):** indicates total nurses' practice regarding patients with head trauma during golden hour. The table reveals that more than three quarters (77.1%) of studied nurses had incompetent practice level regarding patients with head trauma during golden hour with mean  $\pm$  SD (85.97 $\pm$ 71.61).

**Table (4)** clarifies total nurses' attitude regarding patients with head trauma during golden hour. The table reveals that most (91.4%) of studied nurses had negative attitude level regarding patients with head trauma during golden hour with mean  $\pm$  SD (107.5 $\pm$ 8.1).

**Table (5)** illustrates that there was no statistically significant correlation with p. value  $>0.05$  between total nurses' knowledge, attitude, and practice and their age, experience in the hospital, experience in the ED.

**Discussion:** The current study revealed that more than half of the studied nurses' age more than twenty-five years old, these findings agree with **Salem, Ali & Taha (2022)** who found in the study about "Assessment of Nurses' Performance Regarding Rapid Response Code", that majority of the studied nurses' age were between 18-34 years old. This is supported by **Khalifa, Talaat & Hussein (2021)** who clarified in the study about "Nurses' Performance of Golden Hours for Trauma in Helwan General Hospital", that slightly less than one half of studied nurses have age group (20-30 years old).

The current study revealed that majority of the studied nurses were male. The current finding is inconsistent with **Salem, Ali & Taha (2022)** who revealed that more than half of the studied nurses were female nurses. These findings are supported by **Abd El-Gawad, (2019)** who found in the study about "Effect of Education Program on Nurses Performance Regarding Traumatized Patient Care during the Golden Hour in Emergency Room", that more than two-thirds of studied were females. Furthermore, **Hussein, (2018)** who's study about "Intensive Care Unit Nurses' Performance Regarding Caring Patients with Head Injury: An Educational Intervention", revealed that more than three quarters of study nurses were females.

The current study revealed that less than two-thirds of the studied nurses were married, this finding matches with **Salem, Ali & Taha (2022)** who found that majority of the studied nurses were married. In addition, **Mohamed (2022)** reported in the study about "Prognostic Value of Cardiac Troponin Release in Head Trauma Patients", that two-thirds of studied sample were married. Furthermore, **Ahmed (2021)** found in her study about "Nurses' Performance Regarding Patients with Head Trauma", that more than two thirds of the studied nurses were married. Regarding to residence, nearly three quarters of the studied nurses were living in rural areas. This finding corresponds with **Mohamed (2022)** who reported that more than two quarters of studied sample were from rural areas.

In relation to educational level and job experience, more than half of the studied nurses had technical institute. This is supported by **Ahmed (2021)** who found that more than two-fifth of the studied nurses had technical institution of nursing. Furthermore, **Khalifa, Talaat & Hussein (2021)** who clarified that more than one half of studied nurses have health technical nursing. Also, these results are like **Zedan, (2021)** who found in the study about “Educational Guidelines for Nurses’ Competence Level Caring for Patients with Accidental Chest Trauma during Emergency Period” that two-thirds of the studied nurses had technical institute degree.

The current finding is inconsistent with **Salem, Ali & Taha (2022)** who revealed that more than half of the studied nurses had bachelor’s degree. Also, **Maarouf (2012)** in the study about “Nurses’ Performance for Patients with Traumatic Head Injury during Golden Hour”, found that nearly half of the sample on the ED nurses, had bachelor’s degree nursing science. This may be due to these places concerning with the educational level.

The present study clarified that more than half of the studied nurses had less than 5 experience years in hospital, and slightly less than two-thirds of them had experience in the ED. This result works in with **Ahmed (2021)** and **Khalifa, Talaat & Hussein (2021)** that more than half of the studied nurses had experience years less than five years in ICU. This is supported by **Zedan, (2021)** who found that more than half of the studied nurses had have experience in emergency less than five years. While the current finding is inconsistent with **Salem, Ali & Taha (2022)** who revealed that more than half of the studied nurses their years of experience were from five to nine years. Furthermore, **Abd El-Gawad, (2019)** found that the majority of studied nurse have training program, more than half of study nurse had more than 5-15year experience in ED. This may be due to the different time of the study and increase number of studied nurses.

As regarding to attendance of training courses about head trauma, the current study revealed that the highest percentage of studied nurses didn’t attend any training course. This could be due to lack of facilities, motivation, no training place, or enough time to learn or update their knowledge and practice. Therefore, continuous education in nursing is needed to promote development of knowledge and practice and improve quality of care to give for their patients, also the training courses played important role in enhancing and updating nurses’ knowledge and performance. The current result agrees with **Ahmed (2021)** who showed that about two thirds of the studied nurses didn’t receive any form of training regarding head trauma management. This finding was supported by **Mohamed, AbdELstar & Gendy, (2019)** who revealed in the study about “Nurses’ Performance Regarding Patient with Traumatic Head Injury in Intensive Care Unit” that majority of the studied nurses had no previous training courses regarding care of patients with traumatic head injury.

Regarding to overall the nurses’ knowledge, the current study showed that less than one quarter of the studied nurses had satisfactory knowledge about care of patients with head trauma during golden hour. This might be due to more than half of nurses were technical institute, had less



than five years' experience in critical care as well as lack of motivation, ED nurses had not enough time to attend conferences and workshops to enrich and update knowledge, ED nurses workload with shortage of the staff number and insufficient courses. These current findings agree with **Ahmed, (2021)** who found that only three fifths of the studied nurses had unsatisfactory knowledge about care of patients with head trauma at ICU. In addition, **Khalifa, Talaat & Hussein (2021)** mentioned that more than two thirds of the studied nurses had unsatisfactory knowledge about care of trauma patients.

Concerning to total practice, the current study demonstrated that less than one quarter of the studied nurses had competent practice level. From the point of researcher's view, the incompetent practice may be due to lack of nurses' knowledge before program, more than half of the studied nurses, more involved in administrative work, lack of qualification as more than half of nurses had a technical institute degree, more than half of them had less than five experience years in the hospital and the ED, nearly two thirds of them didn't attend any training, as well as the doctors did some practice instead of the nurses, insufficient equipment, shortage of nursing staff and increase number of trauma patients.

These results are consisted with **Ahmed, (2021)** who revealed that more than three quarters of the studied nurses had total unsatisfactory practice regarding patients with head trauma. In the same line, **Khalifa, Talaat & Hussein (2021)** mentioned that about two thirds of the studied nurses had incompetent practice about trauma patients. In the same consequence, **Hussein, (2018)** who found that more half of the study nurses had unsatisfactory total practice level regarding caring patients with head injury. While these results interfere with **Mohamed, AbdELstar & Gendy, (2019)** who revealed that majority of studied nurses had satisfactory level regarding total nursing practice score regarding care of patient with traumatic head injury. This finding was agreed with **Shehab, Ibrahim & Abd-Elkader, (2018)** who reported that majority of studied nurses had satisfactory level regarding total nursing practices score regarding head trauma nursing care.

Concerning to total attitude, the current study demonstrated that less than one fifth of the studied nurses had positive attitude level. This finding is consistent with **Salem, Ali & Taha (2022)** who found that majority of the studied nurses had negative attitude regarding rabid response related cardiac arrest. In the same contex, **Mahday, Mersal & Hessian, (2016)** revealed that majority of the studied nurses had negative attitude regarding patients with increased nntocranial pressure.

Concerning with correlation of total knowledge with total attitude and total practice. The present study results revealed that there was no statistically significant correlation with  $p$ . value  $>0.05$  between total nurses' knowledge, attitude, and practice and their age, experience in the hospital, experience in the ED. These findings are consistent with **Zedan, (2021)** who found that there was no significant correlation between the nurses' knowledge, practice and attitude

regarding care of patients with accidental chest trauma during emergency period. In the same line Ahmed, Taha & Zatton, (2016) mentioned that there was no statistically significant association between the nurses' knowledge and practice regarding trauma patients during golden hour in the emergency department.

**conclusion:**

According to the results of the present study, it can be concluded, nurses' performance regarding patients with head trauma during golden hour was unsatisfactory and there are needs for special educational program for nurses regarding patients with head trauma during golden hour..

**Recommendations :**

In view of the main results of the study the following recommendations were derived and suggested:

- Training programs are highly recommended to improve nurses' performance regarding patients with head trauma during golden hour as well as reinforcing positive attitude patients with head trauma.
- Standard nursing procedures booklet should be available to guide nurses giving the adequate care nurses' performance regarding patients with head trauma during golden hour to prevent complication and mortality.
- Close supervision and teaching on spot are needed to ensure that quality of care is provided by nurses while performing any procedures related to care of patients with head trauma
- Further study is proposed to evaluate the effect of educational program on nurses' performance regarding patients with head trauma during golden hour.

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

Variables	Frequency	Percent
Age per years		
≤25 years	15	42.9
>25 years	20	57.1
Mean ±SD	28.9±6.6	
Median(range)	27(21-50)	
Sex		
Males	34	97.1
Females	1	2.9
Social Status		
Married	21	60.0
Single	14	40.0
Residence		
Rural	25	71.4
Urban	10	28.6
Education		
Diploma	8	22.9
Technical institute	18	51.4
Specialty institute	6	17.1
Bachelors	3	8.6
Experience in the hospital		
<5 years	19	54.3
≥5 years	16	45.7
Mean ±SD	7.8±7.2	
Median(range)	4(1-25)	
Experience in the ED		
<5 years	21	60.0
≥5 years	14	40.0
Mean ±SD	6.4±6.9	
Median(range)	3(1-20)	
Training course about head trauma		
Yes	13	37.1
No	22	62.9

Table (2) Total Studied Nurses' Knowledge regarding Patients with Head Trauma during Golden Hour Throughout Study Phases (n=35):

Total Studied Nurses' knowledge	No	%
Total nurses' knowledge		
Satisfactory	5	14.3
Unsatisfactory	30	85.7
Mean $\pm$ SD	42.37 $\pm$ 17.83	

Table (3): : Total Studied Nurses' Practice regarding Patients with Head Trauma during Golden Hour throughout Study Phases (n=35):

Total Studied Nurses' Practice	No.	%
Total nurses' practice		
Competent	8	22.9
Incompetent	27	77.1
Mean $\pm$ SD	85.97 $\pm$ 71.61	

Table (4): Total Studied Nurses' Attitude regarding Patients with Head Trauma during Golden Hour throughout Study Phases (n=35):

Total Studied Nurses' attitude	No.	%
Overall nursing attitudes		
Positive	3	8.6
Negative	32	91.4
Mean $\pm$ SD	107.5 $\pm$ 8.1	

Table (5) Correlation matrix between nurses' knowledge, attitude, practice, age, experience in the hospital, experience in the emergency department (n=35):

Variables	Nurses' knowledge score		Nurses' attitude score		Nurses' practice score	
	r	p	r	p	r	p
Nurses' knowledge score	1					
Nurses' attitude score	-.197	0.256	1			
Nurses' practice score	0.255	0.139	0.019	0.914	1	
Age	-.263	0.127	0.022	0.901	0.097	0.58
Experience in the hospital	-.184	0.29	0.075	0.667	0.067	0.703

Experience in the ED	-.176-	0.313	-.009-	0.959	0.06	0.73
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(r) correlation coefficient \*\* Correlation is significant at the 0.01 level (2-tailed). \* Correlation is significant at the 0.05 level (2-tailed).

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