Nurses 'Performance Regarding Patient with Traumatic Head Injury In Intensive care unit

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Abstract

Background: Head injury is a trauma to the head that may or may not include injury to the brain. Traumatic head injury (THI) is the leading cause of death and disability in young adults in the developed countries. **The aim of this study**: was to assess nurses' Performance regarding caring of Patient with traumatic head injury in Intensive care unit. **Design:** A descriptive exploratory study **Setting:** the study was conducted in the intensive care unit (ICU) at Ain shams University Hospital. **Study Subjects**: A convenience sample of nurses (No=40). **Data collection tools:** Nurses' Self-administered questionnaire and Observational checklists of caring for traumatic head injury. **Results**: Approximately seventy five percent of the studied nurses had unsatisfactory level about total knowledge regarding caring of patient with traumatic head injury and eighty percent of the studied nurses had satisfactory level regarding total practice about traumatic head injury, there was statistically significant relation between total knowledge and total practice. **Conclusion:** Based on the study findings, most of the studied nurses at intensive care unit had unsatisfactory level of knowledge and satisfactory level about practice regarding caring for patients with traumatic head injury in intensive care unit. **Recommendation**: Further studied was recommended to evaluate the reflection of in-service training program regarding caring of patients with traumatic head injury in intensive care units on nurses' performance and consequently on the patients' outcome.Orientation and periodic in-service training program for nurses in intensive care units regarding caring for patients with traumatic head injury for continuous updating their knowledge.

Keywords: intensive care unit, nurses' Performance, traumatic head injury.

Introduction

Head injury is any kind of injury to the brain, skull, or scalp. This can range from a mild bump or bruise to a traumatic head injury. Common head injuries include concussions, skull fractures, and scalp wounds. Head injuries may be either closed or open. A closed head injury is any injury that doesn't break the skull. An open, or penetrating, head injury is one in which something breaks the skull and enters the brain. (**Lauren Reed-GUY, 2017)**

The nervous system has two major parts: the central nervous system (CNS) and the peripheral nervous system (PNS). The central system is the primary command center for the body, and is comprised of the brain and spinal cord. The peripheral nervous system consists of a network of nerves that connects the rest of the body to the CNS. The two systems work together to collect information from inside the body and from the environment outside. (**American Cancer Society, 2014)**

Head injuries are dangerous. They can lead to permanent disability, mental impairment, and even death. To most people, head injuries are considered an acceptable risk when engaging in sports and other types of recreational activities. But there are steps the

patient can take to lower the risk and protect him. Head injury is the leading cause of death in many countries. (**Debas et al, 2015)**

Mortality rates after head injury are highest in people with a severe traumatic head injury. In the first year after a THI, people who survive are more likely to die from seizures, septicemia, pneumonia, digestive conditions, and all external causes of injury than are other people of similar age, sex, and race. However, the mortality rate after severe THI has decreased since the late 20th century. (**Centers for Disease Control and Prevention, 2017)**

According to the Centers for Disease Control (CDC), there were approximately 2.8 million 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 , Gao , Juengst , Wagner , Fabio , 2018)**

It is predicted that injuries will be among the top 20 leading causes of death worldwide by 2030. In Egypt, injuries burden is significant as it was the fifth leading cause of death in 2004. Also, it's considered as a hidden epidemic due to under-reporting. Updated statistical records for TBI in Egypt are lacking.**(World Health Organization,2009)**

Traumatic 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. Axonal tissue is specialty exhibition to injury **(Gouello et al., 2014).**

Head injury may lead to a concussion; it is a brief unconsciousness without visible structural destruct to the brain. Symptoms of head trauma involve: loss of memory and confusion, vomiting, partial paralysis or numbness, shock, dizziness, anxiety. After a head injury, there may be a time of unconsciousness followed by duration of confusion and loss of memory with disorientation and a breakdown in the ability to storage and regain new information. Also appear temporary amnesia following head injury that starts with loss of memory over a period of weeks, months, or years before the trauma. As the patient recovers, returns memory slowly. Post-traumatic amnesia refers to memory loss for events during and after the accident (**Kumar et al., 2018).**

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. **(National Institute of Neurological Disorders and Stroke, 2015)**

Nursing care of the patient with a THI involves providing the individual with a safe environment and managing any cognitive deficits and physical needs of the patient. Each patient will display different symptoms of the THI, therefore nursing interventions and considerations are individualized to each patient. Often these interventions will include strategies for Physical impairments, Behavior management, Communication management, Emotional support, Environmental management

(safety of their environment and home preparation), Family support, Health education, Memory training, Socialization enhancement, Speech therapy; and Any unilateral neglect management. (**Greenwood, Barnes, McMillan & Ward, 2013).**

Significance of the study

Traumatic head Injury continues to be an enormous public health problem, even with modern medicine in the 21st century. Most patients with THI (75-80%) have mild head injuries; the remaining injuries are divided equally between moderate and severe categories. The cost to society of THI is staggering, from both an economic and an emotional standpoint. Almost 100% of persons with severe head injury and as many as two thirds of those with moderate head injury will be permanently disabled in some fashion and will not return to their premorbid level of function **(Baltopoulos., 2015)**

Nurses are becoming increasingly responsible for management of the care of those patients. Nurses' knowledge and practice can be crucial and constructive in patients' training and hence the reduction of complications during the life with head injury. The nurses' performance has a vital role in reducing the morbidity and mortality of patient with head injury (**Debas et al., 2015).**

Aim of the study:

This study aimed to assess nurses' Performance regarding caring for Patient with traumatic head injury in Intensive care unit.

Research Question:

• What is the nurses' level of knowledge regarding care for Patients with Traumatic head injury in intensive care units ?

• What is the nurses' level of practice regarding care for Patients with Traumatic head injury in intensive care units?

Subjects and methods

The technical design:

Included research design, setting, subject and tools for data collection.

A) Research Design:

A descriptive exploratory design was used to conduct this study.

B) Setting:

This study was conducted in the intensive care unit at Ain shams University Hospital.

C) Subject:

A convenience sample of 40 nurses who caring for patient with traumatic head injury in critical care unit at ain shams university Hospital .The studied sample of nurses were females and male, with different ages, different educational levels and different of experience .

D) Tools of data collection:

Two tools were used in the current study as the following :

I-Nurses' Knowledge Assessment Tool for Caring for patient with traumatic head injury in intensive care units:

(I) Self-administered questionnaire.

This tool was developed by the researcher and was written in simple Arabic Language to suit the nurses' level of understanding and was divided in two parts as follows:

Part I:

It was concerned with assessment of demographic characteristics of studied nurses, characteristics such as (age, gender, marital status, level of education, years of experience and previous training courses regarding nurses 'caring for patient with traumatic head injury.

Part II:

This part was developed by the researcher after reviewing the recent and relevant literature **(Shulman, Joshua 2012, Alberts & Cherian 2014, Shackelford , et al 2017 ,Hammad , et al 2018**) this aim was to assess nurses' knowledge regarding traumatic head injury and the nursing management, the tool consists of 75questions in the form of

(multiple choices& true and false and list question). true question has one score and false question takes zero , the questions are categorized as regard anatomy &physiology of head and brain, investigation , symptoms, causes and complications of head injury ,then nursing management of patient with head injury that include (care of patient on mechanical ventilation, Sources that contribute to the transmission of infections within the ICU) and infection control measures that include (hand hygiene , use of protective equipment's and equipment &environment of critical care unit.

The scoring system:

The correct response was given a score of 1 and the incorrect was given zero. Total score for the questionnaire was75. Score less than 85% (less than 63.75 grades) was considered as unsatisfactory and the score equal or more than 85% (more than 63. 75 grades) was considered as satisfactory.

(II)Nurses'practices observational check lists:

This tool was developed by the researcher based on reviewing the related literature. **(Sandra 2010, Wikipedia 2012, Campbell , et al, 2014, kockrowel et al, 2015, American heart association 2016).** It was used to assess Nurses' practice for caring of Patient with traumatic head injury in intensive care unit. It included Observational check lists for assessment Nurses' practice for Patient with traumatic head injury in critical care unit; based on the most recent related literature review. It includes six parts: observe blood pressure (26 steps) , Maintain airway clearance (Oropharyngel &nasopharyngel suction) (23 steps) , endotracheal tube care (20 steps) , Glasgow coma scale (GCS) assessment (15 steps) , Administration of nasogastric tube feeding (40 steps) , Cardiopulmonary resuscitation (21 steps).

The scoring system-:

The step done completely was given a score of 1grade, while the incorrectly done step or not done had given zero. A total score for checklist was145 grades distributed as follows-:

i. observe blood pressure (26 grades)

ii. Maintain airway clearance (Oropharyngel &nasopharyngel suction) (23 grades)

iii. Endotracheal tube care (20 grades)

iv. Glasgow coma scale (GCS) assessment (15grades)

v. Administration of nasogastric tube feeding (40grades)

vi. Cardiopulmonary resuscitation (21 grades) Score less than 85% was considered as unsatisfactory done and the score equal or more than 85% was considered as satisfactory done.

Operational design:

The Operational design was included preparatory phase, content validity and reliability, pilot study and field work.

A) The preparatory phase :

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

B) Content validity and reliability :

Validity was tested through seven panels of experts from faculty of nursing , Ain shams University including (four) professors of medical- surgical nursing department &(two) assistant professors of medical- surgical nursing department and one intensive care physician to ensure its validity for comprehensive, clarity, accuracy and relevance

Reliability of tools was tested by using a Cornbach's Alpha of (%) for knowledge testing and checklist performance that was reliable at (0.846) according to knowledge & (07847) according to practice.

C) Pilot study:

A pilot study was carried out on 10 nurses from the study subjects to test clarity, applicability, feasibility & relevance of the tools used and to determine the needed time for the

application of the study tools. The nurses who were included in the pilot study were included to the sample because no modifications were done after the conducting pilot study .

D) Field work :

- The purpose of the study was simply explained to the studied nurses who agree to participate in the study prior to data collection.
- The actual work of this study started and completed within six month from January (2018) and was completed by the end of June (2018)
- Data were collected by the researcher during nurse's interview two day per week, at morning and afternoon shifts in previously mentioned study settings during Care of patient with traumatic head injury in critical care units.
- First the researcher used the observational checklists to assess nurses' practice during their actual work, and then the questionnaire was filled by the nurses themselves in their available time during their work.
- The time needed for completing the questionnaire was about 45 minutes for every nurse.
- Interview with nurses before starting data collection and explanation for nurses' about the purpose of the study will be done to assure their participation in the study, nurses will be informed about the privacy of their information, nature of the study, their right to withdraw and the confidentiality of the subject data .

Results:

Table (1) shows the percentage distribution of demographic characteristics among nurses included in the study. The mean age of the studied nurses 26.59±8.45, was found that 50% of them were within the age group 25-40 years. While 97.5 % of the nurses were female, 45% were married as well as the single ,regarding the educational level 82,5% study nurses were had technical nursing education, regarding the experience years 50% of the nurses their years of experience less than 5 years, also 22.5% attending training courses of the studied nurses.

- The researcher assured the nurses that the information collected will be treated confidentially and that it will be used only for the purpose of the research study.

Administrative design:

To carry out this study , the necessary approval was obtained from the hospital director .A letter was issued to them from the Faculty of Nursing , Ain Shams University explaining the purpose of the study to obtain the permission for conducted this study .

Ethical considerations:

Approval of the study protocol was obtained from ethical committee in the faculty of Nursing at Ain Shams University before starting the study. The researcher clarified the objectives and aim of the study to nurses who included in the study. The researcher assured maintaining anonymity and confidentiality of subjects' data. Nurses were informed that they are free for choosing to participate or not in the study and they have the right to withdraw from the study at any time without giving any reasons.

Statistical design:

The collected data were organized, categorized, tabulated and statistically analyzed using the statistical package for social science (SPSS) version (20) to assess nurses' level of knowledge and practice regarding caring for Patient with traumatic head injury in Intensive care unit. Data were presented in tables and graph. The statistical analysis included; percentages distribution, the arithmetic mean ($\bar{X}$), standard deviation (SD), chi-square(X2), and person correlation (R)

Table (2) shows that (80%) were satisfactory regarding to head injury management while (20%) were unsatisfactory. And measuring blood pressure with highest satisfactory level with 82.5% on the other hand 55% of total practice regarding oropharyngeal & nasopharyngeal suction were unsatisfactory.

Table (3) clarifies that (75%) were unsatisfactory regarding to knowledge of head injury while (25%) were satisfactory. And knowledge about nursing intervention toward caring for patient with head injury with highest satisfactory level with 52.5% While, 85% of total knowledge regarding knowledge about causes, symptoms and complication were unsatisfactory. Also, 85% of knowledge about diagnosis and treatment of head injury among studied nurses were unsatisfactory.

Table (4) reveals that there is statistically significant relations between nurses' total knowledge and attending training courses (005*).While there is highly statistically significance between total knowledge scores in relation to educational qualification, years of experience and marital status among studied nurses (0.001**). Also no statistically significance relations between nurses' total knowledge in relation to age in years and gender (0.05).

Table (5) shows that there is positive correlation between total knowledge and practice score of studied nurses regarding care of head injury (<0.05*)

Table (1): Frequencies and percentage distribution of personnel characteristics of the studied nurses (n=40)

Personnel characteristics		No	%
Age			
18≤ 25		17	42.5
25≤40		20	50.0
>40		3	7.5
Mean ±SD	**26.59±8.45**		
Gender			
Female		39	97.5
Male		1	2.5
Years of experience			
Less than 5 years		20	50.0
5-<10 years		17	42.5
10-<15 years		1	2.5
More than 15 years		2	5.0
Mean ±SD	**9.76±5.34**		
Educational qualification			
Secondary nursing education		3	7.5
Technical nursing education		33	82.5
Baculare of nursing		4	10.0
Marital status			
Married		18	45.0
Divorced		4	10
Single		18	45.0
Training			
Yes		9	22.5
No		31	77.5

Table (2): Distribution of studied nurses total practice score regarding head injury management (n=40).

Item	Satisfactory done		Unsatisfactorydone	
	No	%	No	%
measuring blood pressure	33	82.5	7	17.5
Oropharyngeal & nasopharyngeal suction	18	45.0	22	55.0
endotracheal tube care	27	67.5	13	32.5
assessment of Glasgow coma scale	21	52.5	19	47.5
administration of nasogastric tube feeding	32	80.0	8	20.0
cardiopulmonary resuscitation	19	47.5	21	52.5
Total practice score	**32**	**80.0**	**8**	**20.0**

Table (3) Distribution of studied nurses total knowledge score regarding head injury (n=40).

Item	Satisfactory		Unsatisfactory	
	No	**%**	**No**	**%**
knowledge about anatomy and physiology of head and brain	10	25.0	30	75.0
knowledge about causes, symptoms and complication of head injury	6	15.0	34	85.0
knowledge about diagnosis and treatment of head injury	6	15.0	34	85.0
knowledge about nursing intervention toward caring patient with head injury	21	52.5	19	47.0
knowledge about nursing intervention toward caring patient with head injury under ventilator	15	37.5	25	62.5
Total knowledge score	**10**	**25.0**	**30**	**75.0**

Table (4) Relations between studied nurses' total knowledge score and their Personnel characteristics (n=40)

Personnel characteristics	Unsatisfactory <85%		Satisfactory ≥ 85%		Total		Chi square test	P value
	No	%	No	%	No	%		
Age in years							2.76	>0.05
18≤ 25	15	88.2%	2	11.8%	17	100.0%		
25-40	13	65.0%	7	35.0%	20	100.0%		
More than 40	2	66.7%	1	33.3%	3	100.0%		
Gender							3.07	>0.05
Female	30	76.9%	9	23.1%	39	100.0%		
Male	0	0.0%	1	100.0%	1	100.0%		
Educational qualification							13.81	<0.001**
Secondary nursing education	3	100.0%	0	0.0%	3	100.0%		
Technical nursing education	27	81.8%	6	18.2%	33	100.0%		
Bachelor of nursing	0	0.0%	4	100.0%	4	100.0%		
Years of experience							18.03	<0.001**
Less than 5 years	20	100.0%	0	0.0%	20	100.0%		
5-<10 years	10	58.8%	7	41.2%	17	100.0%		
10-<15	0	0.0%	1	100.0%	1	100.0%		
More than 15 years	0	0.0%	2	100.0%	2	100.0%		
Marital status							13.92	<0.001**
Married	16	88.9%	2	11.1%	18	100.0%		
Divorced	0	0.0%	4	100.0%	4	100.0%		
Single	14	77.8%	4	22.2%	18	100.0%		
Training							5.78	<005*
Yes	4	44.4%	5	55.6%	9	100.0%		
No	26	83.9%	5	16.1%	31	100.0%		

Table (5): Correlation between total knowledge and practice score of studied nurses regarding care of head injury (n=40)

Variables	Total practice score	
	R	P value
Total knowledge score	.352	<0.05*

Discussion:

Traumatic head injury (THI), also known as intracranial injury, occurs when an external force injures the brain. THI can be classified based on severity, mechanism (closed or penetrating head injury), or other features (e.g., occurring in a specific location or over a widespread area). Head injury is a broader category that may involve damage to other structures such as the scalp and skull. THI can result in physical, cognitive, social, emotional, and behavioral symptoms, and outcome can range from complete recovery to permanent disability or death. (**Grindler GA,. 2016**

Regarding to demographic characteristics, the present study showed that, about less than half of the studied nurses' ages range from 18-25years and most of them were females. This finding could be interpreted in the light of the fact that majority of nurses in Egypt are females and their number are still greater than males in nursing fields till ten years ago. Regarding to educational level, the present study showed that, more than three quarter of study nurses were graduated from nursing institute. And the majority of them didn't attend training course.

This result similar to **Hussein(2018**) who's study about "Nurses' performance regarding caring patients with head injury: An educational intervention" at zagazig university , it revealed that, less than half of study nurses' ages range from 18-25years , the majority of them didn't attend training courses and more than three quarter of them were females.

These results also, were similar to **Taha (2007)** whose study about "Nurses' performance in emergency management of patient's with spinal cord injury", in Egypt, Who stated that more than three quarter of them were females. Also is consistent with **Taha (2014),** who study about "Effect of training program on nurses' performance for caring for patients with traumatic brain injury", in Egypt, Who stated that more than three quarter of them were females.

In The present study also showed that less than half of the studied nurses' ages range from 18-25year.This result may be due to most of nurses under study are newly graduated and there are mandatory period after graduation and many of them after receiving years of experience tends to travel to work abroad. This result disagreed with **Maarouf (2012)** whose study about "Nurses' performance for patients with traumatic head injury during golden hour "at ain Shams University. Who stated that the majority of nurses' age ranged between 20-25 years. Also **Taha (2014),** who stated that the majority of the nurse's age was between 18-30 years.

The present study also showed that, half of the studied nurses had less than 5 years of experience in intensive care unit. This finding may be due to the fact that most of the nurses under study were recently graduated, most of them had been age less than 25 years, work stress, severity of patient condition, hours of work and occupational hazards facing them in intensive care unit, all of this prevent them from continuing work as critical care nurse. And most of them did not attend training courses.

This finding were in agreement with **Shehab, Ibrahim & Abd-Elkader (2018**) who mentioned in a study entitled" Impact of an educational program on nurses' knowledge and practice regarding care of traumatic brain injury patients at intensive care unit" at Suez canal university hospital, who stated that about half of the studied nurses had less than 5 years of experience in intensive care unit and did not attend training courses.

Concerning training courses. The present results showed that, the majority of nurses under study had no previous training courses regarding care of patients with traumatic head injury. This may be due to shortage of staff, workload and lack of time in ICU. Or might be due to lack of in service training programs and the staff nurse lake of awareness about importance of training courses that improve their performance and its positive effect on quality of care and prevention of complication of head injury. This result is similar to **Shehab, Ibrahim & Abd-Elkader (2018), Hussein (2018)** where reported that the majority of the study subjects didn't attend training course about head injury.

This findings were agreement with **Al-Hawaly, Ibrahim & QaLawa (2016**) who mentioned in a study entitled about "Assessment of Nurses' Knowledge and Performance Regarding Feeding Patients with Nasogastric Tube in Ismailia General Hospital " which showed that two thirds of studied nurses' had nursing institute of education. Also **Hussein(2018)** who revealed that more than half of study nurses having technical nursing institute.

This findings were disagreement with **seliman, Morsy, Sultan, Elshamy & Ahmed (2014)** who mentioned in a study entitled" Impact of a Designed Head Trauma Nursing Management protocol on critical care nurses' knowledge and practices at emergency Hospital Mansoura University" who reported that the majority of nurses under study were having diploma of nursing science. Also **Elsayed (2009)** who study about" Effect of an educational program on nurses, performance during the golden hour of care for traumatized

patients" who reported that all the nurses were having diploma of nursing science.

In relation to marital status, the study showed that, more half of nurses under study were unmarried. This result compatible with **Taha (2014),Maarouf (2012)** who stated that more half of nurses under study were unmarried. But also these results were disagreement with **Hussein (2018)** who study about " Intensive Care Unit Nurses' performance regarding caring patients with head injury: An educational intervention" it revealed that, more half of nurses under study were married.

Concerning nurses' level of knowledge about traumatic head injury, the present result showed that, most of studied nurses had unsatisfactory level about traumatic head injury anatomy, physiology, complication, symptoms, causes, diagnosis, treatment and nursing intervention toward caring patient with head injury under ventilator. In relation to total knowledge about disease, three quarter of the studied nurses had unsatisfactory level.

This finding agreed with **Maarouf (2012)** who study about "Nurses' performance for patients with traumatic head injury during golden hour "at ain shams university. Who stated that the most of studied nurses had unsatisfactory level about definition of traumatic head injury, anatomy, physiology, complication, symptoms, causes and laboratory investigation. And also **Taha(2007)** who found that more than half of the studied nurses had unsatisfactory level about anatomy, physiology of nervous system.

But this finding were disagreed with **Taha (2014**) who stated that, more than half of studied nurses had satisfactory level of total knowledge about traumatic head injury (THI) anatomy and physiology. Also with **Hussein (2018)** who found that majority of the studied nurses had a satisfactory level of total knowledge about traumatic head injury (THI) anatomy and physiology.

(**Seel et al., 2015)** found that the studied nurses must be knowledgeable about THI and care of patients with THI because patients, their families, and the lay public rely on nurses for accurate information. However, our findings show that misconceptions and variations in beliefs about THI exist. These issues suggest variability in nursing practice patterns, which may be associated with poor patient outcomes. More education and training are needed for nurses to ensure that they have factual information about THI and to clarify the role of nurses in caring for patients with THI.

Regarding to the nursing intervention toward caring for patient with head injury, the results revealed that, more than half of the studied nurses had satisfactory level about knowledge. This result disagree with **Maarouf (2012)** who stated that, majority of the studied nurses had unsatisfactory level of knowledge about the nursing care for patients with traumatic head injury. Also with **(Watts, Gibbons, and Kurzweil, (2011)** who found that, the minority of the studied sample had satisfactory knowledge regarding nursing care for such group of patients .

Specific knowledge and understanding about head injury is essential to develop best practice and deliver patient care with improved outcomes. The nurses always eager to provide guidance when they are contacted by professional staff members who want to increase their knowledge about caring for the person who has sustained or is living with head injury. (**O'Connor, young and soul, 2008)**

In relation to total knowledge about traumatic head injury (THI), the study showed that, three quarter of the studied nurses had unsatisfactory level about THI. This might be due to lack of continuous educational program regarding nursing management of THI. This result not compatible with **Elsayed (2001)** who mentioned in a study entitled "Developing trauma nurse role "in Egypt, who stated that, most of the studied nurses had satisfactory level of knowledge about traumatic head injury .

Critical care nurses are highly knowledgeable and skilled health care professionals that work in a critical care unit in

collaboration with members of the health care team to provide optimum holistic care. The skills and knowledge of critical care nurses may be directed towards health promotion, prevention, crisis intervention, maintenance, rehabilitation restoration or palliation in care of critically ill patients. Critical care nurses maintain professional competence through on going education, research and skill development and strive to provide evidenced-based practice through promotion of research within their specialty areas. (**Byrne and Valentine, 2005)**

Concerning nurses' level of practice regarding care of patient on mechanical ventilator two third of them had unsatisfactory level of practice regarding suctioning and care of endotracheal tube. Nurses neglect to assess the pulmonary system, check ventilator parameter daily, turn patient on prone position, and record progress of the patient's condition. The result also clarify that effective communications and aseptic technique were not followed during patient care by more than two thirds of nurses under the study.

These result were similar **to Salha (2012)** who mentioned in a study entitled " assessment of nurses' performance for caring of patients on mechanical ventilator" that nurses, physicians must understand every patient with head injury in intensive care unit and work together to set realistic goals for care.it is essential for positive patient outcomes to understand the principles of mechanical ventilation and care needed of such patients, as well as open communication among member of health care team about care of endotracheal tube & suctioning.

This result was similar to **Mohammed (2008)** who reported that there was inadequate performance of suctioning and care of endotracheal tube by nurses under study in intensive care unit adding that may be due to lack of time, lack of special training program to improve quality of patient care. So suction is considered as one of the vital and lifesaving technique that require special training and follow up.

In the present study, more than half of studied nurses' had satisfactory level regarding assessment of Glasgow coma scale (GCS). This finding is inconsistent with **Eldesouky (2016)** who's study about "impact of an educational of program for nurses' knowledge and practice about Glasgow coma scale" who reported that most of study nurses' had unsatisfactory practice regarding(GCS) assessment.

Also, this result disagreement with **Hussein (2018)** who's study about "Nurses' performance regarding caring patients with head injury: An educational intervention" that two third of studied nurses had unsatisfactory practice regarding Glasgow coma scale (GCS).This may be due to the nurse believed that GCS assessment is doctor responsibility .

Concerning nurses' practice regarding blood pressure three quarter of the studied nurses had satisfactory level and more than half of the studied nurses had satisfactory level about endotracheal tube care, while more than half of them unsatisfactory level about oropharyngeal & nasopharyngeal suction. This finding agree with **seliman, Morsy, Sultan, Elshamy & Ahmed (2014)** who reported that the nearly three quarter of the studied nurses had satisfactory level about blood pressure and more than half of them had satisfactory level about endotracheal tube care, while more than half of them unsatisfactory level about suction.

This study also, reported that, majority of them had satisfactory practice regarding nasogastric tube feeding (NG). This finding is disagree **with Al-Hawaly, Ibrahim & QALAWA (2016)** which study about "Assessment of Nurses' Knowledge and Performance Regarding Feeding Patients with Nasogastric Tube in Ismailia General Hospital " which reported that more than half of the studied nurses had an unsatisfactory level of practice regarding care given before NG tube feeding administering. But finding agree **with Ahamed and Mondal (2014)** in their study revealed that most of the studied nurses had a satisfactory level of practiced skill regarding NG tube feeding administering .

In the present study, more than half of studied nurses' had unsatisfactory level regarding cardiopulmonary resuscitation (CPR) practice. This finding is disagreeing with **Hussein (2018**) who mentioned in a study entitled "Intensive Care Unit: Nurses' Performance Regarding Caring Patients with Head Injury: An Educational Intervention". Zagazig University, Egypt. That more than half of studied nurses' had satisfactory level regarding CPR.

The present study found that, the majority of the studied nurses had satisfactory level regarding total nursing practice score. This finding were agreed **with Shehab, Ibrahim & Abd-Elkader (2018)** who reported that the majority of studied nurses had satisfactory level regarding total nursing practices score regarding head trauma nursing care.

This finding were disagreed with **Maarouf (2012)** Who stated that two third of the study nurses had unsatisfactory level regarding total practice score, Also **Hussein (2018)** who found that more half of the studied nurses had unsatisfactory level regarding total practice. Unsatisfactory nursing practices regarding head injury nursing care in the intended ICU. This may be due to shortage of nursing staff to provide high quality nursing care for head injury patients and absence of training courses, or workshops regarding brain trauma nursing care.

The current study illustrated that, there was, a statistically significant relation between training course and knowledge level, also there was a highly statistically significant relation between knowledge level and marital status, education level and years of experience the group with five to ten years of experience has the highest proportion of satisfactory knowledge level , while there were no statistically significant relation between total knowledge level and both age and gender of the studied nurses.

This result disagrees with **Shehab, Ibrahim & Abd-Elkader (2018)** who reported that there is no significant relation between total knowledge and demographic data (age, level of education, years of experience). On the other hand, **Seliman, et al (2014**) who stated that no statistical significant correlation between knowledge and level of education.

This result agree with **Abd El-Aziz, (2014)** who conduct a study on "effect of educational program on nurses, knowledge and skills about oral care for traumatized patients" who stated that; Concerning the relationships between nurses knowledge and skills and their years of experience in nurses, they findings statistical significant between diploma&Bachelor degree, the older nurses with more years of experience and increase of years of experience showed increased of knowledge and practice. Also found that; high education nurses more knowledge and skills than nurse's diploma in all items of oral care procedure .

The finding were consistent with the result in the study of **Meherali, Parpio, Ali & Javed (2012)** which showed that knowledge among CCU nurses is higher in those who have higher experience and having a special degree in critical care units(CCU). Relation between education level and knowledge level with increasing the education level the proportion of cases with satisfactory knowledge increase, also there was a highly statistically significant relation between knowledge level and years of experience.

These result were supported by **Morton & Fontuine (2009)** who mentioned that the nurse must be have knowledge and experience to work efficiently to promote optimal patient outcome , also the nurse must achieve and maintain an up-to date knowledge base of critical care nursing. Also supported by **Wilson (2007**) who found that more than half of the nurses had diploma with specialty degree & the minority of bachelor science nursing (B.S.N) degree and added that (B.S.N) nurses had a more knowledge and practice base than the nurses with diploma .

The correlation between nurses' total knowledge score and total practice

score .Findings of the present study reported that there is a positive correlation between nurses' knowledge and practice. This agree with **Shahin et al., (2012),Taha (2014) and Seliman, et al (2014)** who stated that a highly statistical significant correlation between participants' scores of knowledge and practice.

But this study was contradicted by the study of **Maarouf (2012)** who's study about "Nurses' performance for patients with traumatic head injury during golden hour "at ain Shams University. Who stated that no statistically significant correlation between nurses knowledge and practice.

This result was congruent with a study which was about " mild traumatic brain injury: a Survey of perceived knowledge and learning preferences of Military and Civilian nurses ". The study found that head trauma management is directly influenced by nurses. Therefore, CCNs should be provided with the knowledge, skills, and abilities to care for this important segment of the neuroscience patient population to achieve the best practice and optimal outcomes for traumatic head injury patients**. (Watts, Gibbons, and Kurzweil, 2011)**

In summary, the result of this study revealed that, there is a need to focus on development of nursing staff knowledge and skills, so effort should be directed toward enhancing creativity among nurses. Nurses must have access to update information, learning resources and continuous educational opportunities.

Conclusion

Based on the study findings, most of the studied nurses at critical care unit had unsatisfactory level of knowledge and satisfactory level about practice regarding caring of patients with traumatic head injury in critical care unit.

Recommendation

The results of this study projected the following recommendations.

- Orientation and periodic in-service training program for nurses in intensive care units regarding caring of patients with traumatic head injury for continuous updating their knowledge.
- Further studied is recommended to evaluate the reflection of in-service training program regarding caring of patients with traumatic head injury in intensive care units on nurses' performance and consequently on the patients' outcome.
- Developing a simplified and comprehensive booklet including guidelines about nursing care of patients with traumatic head injury in intensive care units.
- Developing a nursing protocol for infection control, following aseptic techniques during care of patients with traumatic head injury in intensive care units.
- The study should be replicated on large sample and different hospitals setting in order to generalize the result.

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