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RESEARCH PAPER

Assessing the Practices of Intensive Care Unit Nurses Regarding Extern Ventricular Drain Care of Traumatic Brain Injury Patients

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ABSTRACT

Objective of the study is to evaluate the practices of intensive care unit nurses regarding external ventricular drain care of traumatic brain injury patients. Traumatic brain injury (TBI) stands out as the primary cause of mortality in individuals aged 15 to 44, affecting both men and women. This research employed a descriptive cross-sectional design among 36 nurses at the Neuro Intensive Care Unit of Mayo Hospital Lahore. Result of study showed that majority of nurses were female and falls within the 20-30 years category (55.6%). Majority 61.1% of nurses demonstrated a competent level of practice. There is a significant association between socio demographic characteristics and practices of nurses. The study concluded that majority of study participants had competent practices regarding extra ventricular drain care of traumatic brain injury patients. Continuous professional development, interdisciplinary collaboration, regular audits, and a safety-oriented culture are recommended for improving nurses practices caring for traumatic brain injury.

KEYWORDS External Ventricular Drain Care, Intensive Care Unit, Nurses, Traumatic Brain Injury

Introduction

Traumatic brain injury (TBI) occurs when external factors, such as road traffic accidents, sudden head impacts, or violent blows to the head, disrupt normal brain function, leading to damage in the skull and injury to brain tissue (Dash & Chavali, 2018). TBI is a significant contributor to disability and mortality, with an estimated fifty million new cases reported worldwide annually and a mortality rate ranging from 30-40% (Dewan et al., 2018). In Pakistan, the incidence of TBI is reported to be 81 per 100,000 with a 15% mortality rate (Ladak, Enam, & Ibrahim, 2019).

Traumatic brain injury (TBI) stands out as the primary cause of mortality in individuals aged 15 to 44, affecting both men and women. Moreover, TBI is associated with prolonged hospital stays (LOS) and a decrease in the availability of hospital beds for other patients (Jiang et al., 2019). Complications arising from Traumatic Brain Injuries (TBIs) encompass cognitive impairment, challenges in sensory processing and communication, post-traumatic seizures, cerebrospinal fluid (CSF) leakage, skull fractures, vascular or cranial nerve injuries, and the development of post-traumatic hydrocephalus (PTH) (Ahmed et al., 2017).

The external ventricular drain (EVD) is a commonly employed medical procedure for cerebrospinal fluid (CSF) removal in patients dealing with post-traumatic hydrocephalus (PTH) and for alleviating elevated intracranial pressure (Fried et al., 2016). Complications of External Ventricular Drain (EVD) include infectious issues like meningitis (45% incidence), mechanical problems such as tube kinking, system failures, and catheter-related challenges. Physiological complications involve CSF drainage issues. Nurses play a vital role in infection prevention associated with EVD (Fang et al., 2021).

Nursing, as an evolving profession, is consistently seeking evidence-based practices to enhance patient outcomes. The proper management of External Ventricular Drain (EVD) is a primary responsibility of nurses (Oliveira Costa, Medeiros, Martins, Menezes, & Araújo, 2015).

Literature Review

The literature review involves exploring existing studies and findings related to the management of external ventricular drains (EVD) in the context of traumatic brain injury (TBI).

Numerous studies emphasize the significance of proper EVD care in TBI patients due to the potential complications associated with this invasive procedure. Ahmed et al. (2017) highlight the prevalence of complications such as infection, mechanical issues, and physiological challenges linked to EVD use in traumatic brain injury cases. Moreover, Oliveira Costa et al. (2015) stress the crucial role of nurses in ensuring effective EVD management to improve patient outcomes.

In the context of TBI, (Capizzi, Woo, & Verduzco-Gutierrez, 2020) discuss the high mortality rate associated with traumatic brain injuries and their impact on hospital length of stay. Additionally, (Geeraerts et al., 2018) provide insights into the specific incidence rates of TBI in Pakistan, underlining the local relevance of the research.

Understanding the complications of EVD, including infectious, mechanical, and physiological issues, as outlined by (Haddad & Arabi, 2012), becomes paramount in evaluating the practices of ICU nurses. The review indicates a critical need for effective infection prevention strategies, with nurses playing a pivotal role in controlling infections associated with EVD.

In conclusion, the literature review underscores the importance of assessing the practices of ICU nurses concerning EVD care for TBI patients. The existing body of knowledge emphasizes complications, mortality rates, and the essential role of nurses in managing EVD to improve patient outcomes in the context of traumatic brain injuries.

Material and Methods

This research employed a descriptive cross-sectional design and was conducted at the Neuro Intensive Care Unit of Mayo Hospital Lahore. The data collection period spanned from January 6th, 2021, to March 21st, 2021, involving nurses responsible for caring for traumatic brain injury patients. A sample size of 36 was determined, considering a 95% confidence interval and a 5% margin of error, with participant selection facilitated through convenient sampling. Male and female nurses within the age range of 20 to 60 years, actively involved in the care of traumatic brain injury patients, were included in the study. Participants meeting the eligibility criteria, as per established inclusion and exclusion criteria, were recruited upon providing informed consent. Prior to their involvement, participants were comprehensively briefed about the study's objectives, potential risks, and expected benefits, ensuring a clear understanding. Informed consent was obtained to establish a rapport with the participants. Data collection was executed using a structured practice checklist. Subsequently, analysis of the collected data was carried out using the Statistical Package for the Social Sciences (SPSS) Version 24.

Results and Discussion

Table 1
Demographic characteristics of respondents

Demographic Characteristics	Frequency	Percentage
Age		
20-30 years	20	55.6
31-40 years	12	33.4
41-50 years	4	11
Gender		
Male	6	16.7
Female	30	83.3
Qualification		
General Nursing Diploma	10	27.7
Generic BSN	8	22.3
Generic Post RN	18	50
Experience		
1-5 Year	18	50
6-10 Year	14	38.9
11-15 Year	4	11
Department		
Neurosurgery ICU	26	72.3
High dependency unit	10	27.7

Table 1 provides an overview of the demographic composition of the study participants. The age distribution indicates that a considerable percentage falls within the 20-30 years category (55.6%), followed by individuals aged 31-40 years (33.4%) and those aged 41-50 years (11%). Regarding gender representation, a higher proportion consists of female participants (83.3%) compared to male participants (16.7%). The qualifications of the respondents encompass a General Nursing Diploma (27.7%), Generic BSN (22.3%), and Generic Post RN (50%). Professional experience is diverse, with around half of the participants having 1-5 years of experience (50%), followed by those with 6-10 years (38.9%), and 11-15 years (11%). Lastly, participants are distributed between the Neurosurgery ICU (72.3%) and the High Dependency Unit (27.7%) based on their respective departments.

Table 2
Practices of Nurses caring the traumatic brain injury patients

Level of Practice	Frequency	Percentage	Valid Percent	Cumulative Percent
Incompetent	14	38.9	38.9	100.0
Competent	22	61.1	61.1	100.0

Table 2 details the practices of nurses engaged in the care of traumatic brain injury patients. The findings reveal that 38.9% of respondents are classified as having an incompetent level of practice, while 61.1% demonstrate a competent level of practice. The table offers valuable insights into the distribution of nursing practices related to the care of traumatic brain injury patients.

Table 3
Association of nurses' Practices with socio demographic

Demographic Characteristics	Practices		P-Value
	Competent	Incompetent	

Age			
20-30 years	8	4	0.26
31-40 years	10	4	
41-50 years	4	6	
Gender			
Male	6	9	0.21
Female	16	5	
Qualification			
General Nursing Diploma	5	8	
Generic BSN	8	4	0.001
Generic Post RN	9	2	
Experience			
1-5 Year	10	9	
6-10 Year	7	5	0.000
11-15 Year	5	4	
Department			
Neurosurgery ICU	16	6	
High dependency unit	6	12	0.005

Table 3 investigates the correlation between nurses' practices and their socio-demographic characteristics. The table outlines the distribution of competent and incompetent practices across different demographic groups. Age and gender demonstrated non-significant differences (p=0.26 and p=0.21, respectively). In contrast, qualification displayed a notable association (p=0.001), revealing differences among General Nursing Diploma, Generic BSN, and Generic Post RN categories. Experience levels also exhibited a significant association (p=0.000), especially within the 1-5 years, 6-10 years, and 11-15 years' experience brackets. Moreover, the department of work indicated a significant association (p=0.005), underscoring variations in practices between nurses in Neurosurgery ICU and those in the High Dependency Unit.

Discussion

This chapter critically discusses the findings of the present study in relation to existing literature. The primary objective was to assess the practices of intensive care unit nurses in the context of external ventricular drain care for traumatic brain injury patients, involving a total of 36 participants. External ventricular drain (EVD) procedures are vital in neurosciences intensive care units, and nurses' practices significantly impact the delivery of high-quality nursing care while minimizing complications for EVD patients. Real-life exposure to patient care is influenced by various factors such as theory, practice, and personal experience. The study revealed a predominant age group of 20-30 years among participants, aligning with similar research indicating that more than half of studied nurses fell within this age bracket (Mohamed Maarouf & Faltas Marzouk Faltas, 2020). However, these findings contrasted with those of (Abayomi, 2019), who reported a mean age of 42.8+9.4 years among the studied nurses.

The outcomes regarding the total years of job experience indicated that a majority of the participants possessed 1-5 years of experience. These findings are consistent with the observations of (Alunpipatthanachai, Thirapattaraphan, Fried, Vavilala, & Lele, 2019), where majority of nurses reported having 1-5 years of experience. Regarding qualifications, the current study revealed that the majority had Post RN (BSN). This aligns with the findings of (Chu et al., 2019), who reported that majority of nurses were Post RN (BSN) holders.

The current study showed that majority of nurses caring for extra ventricular drain have competent practices. These findings are in line with (Kowalski, Weintraub, Rubin, Gerber, & Olsen, 2018) where majority of nurses had competent practices. Similarly, (Kashid et al., 2020) also had same findings. Whereas, (Rana, Singh, Sharma, & Kumar, 2019)

reported that majority of nurses had incompetent practices. (Whyte, Alhasani, Caplan, & Tully, 2020) also reported same findings.

Conclusion

The study concluded that majority of study participants were females with age range 25-30 year and majority of them having 1-5 year experience and had generic post RN degree. Majority of study participants had competent practices regarding extra ventricular drain care of traumatic brain injury patients. There was a significant association between demographic variables and practices of participants.

Recommendations

To enhance intensive care unit (ICU) nurses' practices in external ventricular drain (EVD) care for traumatic brain injury patients, specialized training, continuous professional development, interdisciplinary collaboration, regular audits, and a safety-oriented culture are recommended. Encouraging research engagement, patient education, refresher courses, and policy reviews further contribute to sustained improvement.

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