



Original Article

Effect of Nursing Guidelines On Practices of Nurses Caring for Traumatic Brain Injury Patients in A Tertiary Care Hospital Lahore, Pakistan

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ABSTRACT

Traumatic brain injury (TBI) is one of the top causes of disability and deaths in the world. However, Pakistan has 81 TBI cases for per 100,000 residents, with a 15% death rate. In order to lower excessive intracranial pressure in brain injury patients, external ventricular drains (EVDs) are frequently used to remove cerebrospinal fluid (CSF). Nursing practices with reference to the care of patients with EVD are greatly improved by EVD care guidelines. Therefore, it is crucial to implement EVD care guidelines in order to enhance their current procedures for EVD care. **Objective:** The aim of the study was to assess the effect of nursing guidelines on practices of nurses caring for traumatic brain injury patients with external ventricular drain in a public hospital of Lahore, Pakistan. **Methods:** A quasi experimental study was conducted. Sample size contained 50 registered nurses. Purposive sampling technique was used to collect the data. A four-week education intervention was delivered to the participant nurses. Through the use of validated questionnaires, information on nurses' practices was gathered twice, before and after the intervention. **Results:** The study found that nurses' practices had significantly improved ($p < 0.001$) following the education. The practices had been competent as post- intervention practices are improved to 32 (64%) from pre- intervention practices 12(24%). **Conclusions:** Guidelines for the care of External Ventricular Drains (EVDs) have a statistically significant impact on nurses' education in EVD care. Guidelines for EVD care considerably improve the nursing practices and reduced EVD consequences in patients with traumatic brain injuries.

INTRODUCTION

Traumatic brain injury (TBI) is the disorder of normal brain function as a result of external trauma [1]. The commonest cause of TBI is engine vehicle collision and falls [2]. In elderly patients the commonest cause of TBI is ground level fall and only seen by trauma services if there is isolated head injury occur. In the same way fall of 20 feet account as mild if there is no serious neurological or orthopedic issue [3]. TBI is one of the top causes of disability and deaths in the world, with 50 million new cases worldwide recorded each year and a fatality rate as high as 30–40% [4]. However, there are 81 TBI cases for every 100,000 people in Pakistan, and the fatality rate is 15% [5]. In developed countries, TBI ranges from 47 to 618 per

100,000 annually. The annual incidence rate of TBI in Finland ranges from 101 to 221 per 100,000 people [6]. TBI is common in developing countries like Pakistan, which has a population of over 18 billion people. In Pakistan, a road traffic injury surveillance study found that 10% of patients had moderate to severe TBI and that 30% of patients had a TBI [7]. Traumatic brain injury is the main cause of death in men and women between the ages of 15 and 44 [8]. The frequency of TBI is more common among adolescent, young adults and male. Though, according to the statistics the risk for TBI in male is more than female. The frequency of TBI was 959.0/100,000 population among male and 810.8/100,000 for female. The percentage was higher for

people of 75 years or older 223.2/100,000 and for age group 15-24 years 1080.7/100,000 population [3]. Additionally, TBI is also related with increased hospital length of stay (LOS) and reduced access to hospital beds for other patients [9]. Cognitive impairment, communication difficulties, sensory processing issues, post-traumatic seizures, cerebrospinal fluid (CSF) leaks, skull fractures (8.5-12%), vascular or cranial nerve damage, and post-traumatic hydrocephalus are among the complications of TBIs [10]. In order to lower excessive intracranial pressure in brain tumor patients, external ventricular drains (EVDs) are frequently utilized to remove cerebrospinal fluid (CSF) [11]. EVD is a life-saving procedure [12]. However, due to the intrusive nature of the device, EVD complications can occur. The EVD has a wide range of consequences, including mechanical difficulties, physiological issues, and infectious complications. Nurses play a vital role in infection control and are essential in EVD infection prevention [13]. The management of External ventricular drain (EVD) is utmost duty of nurses. The main complications of External ventricular drain (EVD) are due to poor nursing care and level of knowledge of nurses regarding care of EVD. Nursing care for patients with EVD includes implementation of specific care throughout the insertion, maintenance, handling and monitoring of the device [14]. In patients with EVD, accurate and accountable nursing care indicates better outcomes [15]. Furthermore, according to studies, educational interventions reduced External ventricular drain (EVD) related complications by 40% to 50% [16]. Good knowledge and practices of nurses will prevent the patients from delayed recovery. Nurses involved in caring for patients with EVD must be knowledgeable and are accountable for ensuring that the care given is based on the EVD care guidelines [17]. Therefore, this study intended to improve the nursing practice on external ventricular drain care to reduce its complications among patients with post-traumatic brain injury. The objective of the study was to assess the effect of nursing guidelines on practices of nurses caring for traumatic brain injury patients with external ventricular drain in a public hospital of Lahore, Pakistan. There is no effect of nursing guidelines on nursing practices among patients with traumatic brain injury. There is an effect of nursing guidelines on nursing practices among patients with traumatic brain injury.

METHODS

This study was a quasi-experimental one group pre-test post-test design. It was conducted in Neurosurgery Intensive Care Unit of Jinnah Hospital Lahore, Pakistan from January 2022 to May 2022. The sample size consists of 50 Registered nurses. It is calculated with 9% margin of

error and 95% confidence interval. The purposive sampling technique was used. All registered nurses aged between 25- 45 year were included in the study. Practices of nurses was assessed through 34 items EVD care checklist. The EVD care practices checklist is taken from AANN guidelines for EVD care. Done item will be marked as "1" and not done or missing item as "0". EVD Care practices are competent if score is >75% and incompetent if score is < 75% [18]. Data was collected at two points, pre and post educational intervention. It consists of three phases. In this phase, all the registered nurses following the inclusion and exclusion criteria were selected in the study. Informed consent in written form was taken from study subjects. Pre-interventional data was collected by researcher and each participant was assessed for practices at their original working place by maintaining secrecy. After completion of pre-intervention phase, a four-week educational intervention through PowerPoint presentation and audio visual demonstration delivered to the participants. In addition, hands on practice of participants via expert were taught to improve the practices. Educational intervention was delivered during morning and evening shift in auditorium of selected research setting. After educational intervention, registered nurses were assessed for practices and patients for complications by using same validated questionnaire. Data was analyzed using SPSS version 23. Frequencies and percentages were calculated. To compare the pre and post practices scores, the Wilcoxon signed rank test was used. P value ≤ 0.05 was measured as statistically significant.

RESULTS

The sample of 50 nurses included 42(84%) in age group 25-35 year & 8(15%) in age group 36-45 year, and six (12%) male & 44(88%) females, and 32(64%) have 2-10-year experience & 18(36%) greater than ten-year experience, and 28(56%) having General nursing diploma, 8(16%) Generic BSN degree, 10(20%) Generic Post RN & four(8%) MSN degree as shown in table 1.

Variable	Categories	Frequency (%)
Age	25-35 Year	42(84%)
	36-45 Year	08(15%)
Sex	Male	06(12%)
	Female	44(88%)
Experience	2-10 Year	32(64%)
	> 10 Year	18(36%)
Qualification	General nursing diploma	28(56%)
	Generic BSN	08(16%)
	Generic Post RN	10(20%)
	MSN	04(08%)

Table 1: Demographic features of participants

Table 2 indicated that before intervention 38(76%) nurses

have incompetent practices whereas 12(24%) had competent practices. After education intervention, the competent score was raised to 32(64%) and incompetent practice score was 18(36%) as shown in table 2.

Practices Categories	Pre-intervention	Post-intervention
	F (%)	F (%)
Incompetent practices	38 (76%)	18 (36%)
Competent practices	12 (24%)	32 (64%)

Table 2: Pre and post EVD care practice intervention score among Nurses

The result of the study proved that there is an effect of nursing guidelines on nursing practices among patients with traumatic brain injury as there was a significant difference between pre and post interventional practices score among nurses regarding EVD care as evident by ($P < 0.001$).

Table 3 shows the change in practices score of pre and post intervention, this was compared using Wilcoxon rank test. The findings revealed that there was a significant difference between pre and post interventional practices score among nurses regarding EVD care as evident by ($P < 0.001$). Furthermore, median scores of practices were improved as shown in table 3.

Variable	N	Pre-intervention Median	Post-intervention Median	Median Difference	Wilcoxon (z) test	P-value
Practices scores	50	12.00	24.00	12.00	-8.732	<0.001

Table 3: Comparison of pre intervention practices score and post intervention practice score

DISCUSSION

Effective nursing care is necessary for all patients admitted in hospital, especially for traumatic brain injury patients. It is recommended that evidence based nursing care should be provided to patients for better patient outcomes. The objective of present study was to assess the effect of nursing guidelines on practices of nurses caring for traumatic brain injury patients with external ventricular drain in a public hospital of Lahore, Pakistan. The discussion was divided into two parts; the first part is concerned with the socio-demographic characteristics of participants. The second part contains the discussion of findings related to the nurses' practices. In Neurosurgery intensive care units, EVD is a lifesaving procedure. The practices of nurses play a major role in provision of good quality nursing care and to reduce the complications among patients who enduring EVD. According to present study, 42(84%) participants were between the ages of 25-30 years. These findings are consistent with another study conducted by Ahmed et al., in 2017 which revealed that more than half (51%) of participant nurses were in the age group 25 -30 years. The findings of this study showed that majority of the participants 32(64%) had experience

between 2-10 years. These findings are in accordance with Elbilgahy & Mohammed (2019) where (49.5%) nurses had 1-5-year experience [19]. According to present study in terms of qualification, majority of participants 56% having General Nursing diploma and 8% having MSN degree. These finding are in accordance with a study conducted in Egypt where 39.4% nurses were diploma holder [19]. The second part of discussion is related to the findings based on nurses' practices regarding care of external ventricular drain (EVD). The results of the study revealed that before educational intervention on EVD care nearly 38(76%) nurses' practices were incompetent. Knowledge and skills become obsolete if these are not put into practice, stressing that practice based knowledge is more meaningful which is observed in our results with the content related to good practices of EVD device maintenance. This study indicated that after receiving educational intervention based on AANN Guidelines for EVD care, the practices of nurses were improved significantly ($p < 0.001$). Dina Mohamed Maarouf (2020) also found a significant improvement in practices of registered nurses, in a study conducted in Egypt [18]. The pretest results in this study were 5%, whereas the posttest results were 75% ($p < 0.001$). The findings of our study were also consistent with those of Tsai-Yun Hsieh's study in Tainan [20]. This study found that nurses' pre-intervention practices were incompetent, but post- intervention practices were greatly improved with a consistent rate of 12 % to 100 % ($p < 0.000$). Souza (2020) in Brazil conducted an interventional study and reported a significant difference in practices of nurses ($p < 0.001$) after educational intervention in neurological ICU [16].

CONCLUSIONS

Guidelines for the care of External Ventricular Drains (EVDs) have a statistically significant impact on nurses' education in EVD care. Guidelines for EVD care considerably improve the nursing practices and reduced EVD consequences in patients with traumatic brain injuries.

Conflicts of Interest

The authors declare no conflict of interest.

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