

Effectiveness of an Educational Program on Nurse's Knowledge About Craniotomies Complications

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Abstract

The purpose of this study is to determine whether an educational program was beneficial in improving nurses' understanding of craniotomy complications. The program aims to increase nurses' knowledge of the potential side effects of a craniotomy, such as infections, bleeding, and neurological abnormalities. A sample of nurses was randomly assigned to be tested in one group pre -post-test. The findings reveal a statistically significant increase in awareness of craniotomy complications in the experimental group compared to the control group, highlighting the value of the educational program in raising nurses' knowledge levels. By ensuring that nurses have the essential information, these findings have significant implications for improving patient outcomes and the standard of care.

Keywords: Educational Program, Craniotomy, nurses.

Introduction

Postoperative care has been extensively studied and proven to be instrumental in reducing complications and improving patient outcomes [14]. Every surgical procedure carries the potential for a range of issues, from mild postoperative concerns to severe complications that can even be life-threatening, exhibiting substantial variability, [12]. To mitigate these risks, close monitoring of patients is essential during the postoperative phase, enabling the early identification of warning signs and proactive prevention of problems [12].

In the context of craniotomy, a surgical procedure involving the removal of a part of the skull bone to access the brain, a temporary bone flap is created using specialized tools. The bone flap is then replaced after the brain surgery [11]. Craniotomy is a neurosurgical technique that involves opening the skull to gain access to the brain, with the procedure referred to as a "craniotomy" [2]. Common reasons for performing a craniotomy include the treatment of subarachnoid hemorrhage, brain tumors, or severe head injuries [3].

To ensure a successful craniotomy with minimal difficulty, a comprehensive understanding of the fundamental anatomy and physiology of the human body is essential. The choice of skull bones to be targeted during the procedure depends on the underlying causes and impact of the specific disease [2].

Complications following intracranial surgery continue to be a major concern for medical professionals, encompassing issues such as hemorrhage, cerebral edema, cognitive impairments, behavioral abnormalities, electrolyte imbalances, infections, seizures, venous thrombosis, and hydrocephalus [15]. Prompt identification and effective

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management of these problems play a crucial role in achieving positive patient outcomes [15].

The surgical approach holds significant importance in contemporary neurological care, allowing the treatment of conditions that were previously considered untreatable. Access to the cerebral space during the management of brain tumors, vascular disorders, or trauma is critical, and any restrictions can have serious implications for the patient. The surgical technique is continuously evolving and updated based on the latest available information [5].

Methodology:

The experimental design was (a one-group pretest-posttest design). Conducted on nurses who work in surgical units at Teaching Neurosurgical Hospital. An application of pre-post- test approach was used to evaluate nurses "knowledge about complications of craniotomy. The study was started from the 7of January 2023 to the 15 of May 2023 Informed agreement was obtained from each participant before the study began, which evaluated the effectiveness of an educational program on nurses' understanding of problems associated with craniotomies. The study's goals were described to the nurses by the researcher, who also let them know that participation in the study was optional. They were also told that they might opt out of the study at any point or decide not to respond to a particular question. Before the study started, the educational program's effectiveness was evaluated using a preliminary method of assessment on (10) nurses in surgical units of neurosurgical teaching hospitals to assess their knowledge about craniotomy and its complications. The result of the preliminary assessment is that 69%of the answer of nurses were lack of knowledge and need education about craniotomy complications A series of lectures, and panel discussions, made up the educational program.

A post-test that was given to the nurses following the completion of the program was used to evaluate the effectiveness of the educational program. The outcomes were contrasted with those of a pre-test that was administered ahead of the start of the educational program. In comparison to their pre-test scores, the nurses' post-test knowledge of craniotomy problems showed a considerable improvement.

The program was designed with three demands the first demand about the anatomy of the brain, the second demand about nurses' knowledge of complications of craniotomy, and the third demand is about nursing management for complications of craniotomy. the data were analyzed using the statistical package for social science (SPSS)version 26.0 software both descriptive and inferential statistics were used to describe the sample Descriptive statistics was used to describe nurses' demographical characteristics represented as the mean \pm standard deviation(SD). Independent T-tests were used for categorical and continuous variables to test the mean difference between the pre and post-test group. Pearson's correlations are used to find a linear relationship between the two continuous variables. While chi-square is used to find the association between categorical variables.

The result:

The present study consisted of 40 nurses. the study results of gender that indicated a female is the dominant gender for the study group (55%) are female. Regarding the age group for the study sample (36 and less) years old (67.5 %), Additionally, the results indicate that the majority (45%) of the study sample are from medical institutes and colleges of nursing degrees, and the monthly income, the study was indicated the 600-900 thousand IQD as 50%. Regarding years of experience in the nursing field, show that the majority sample has (6 and less than) years (50%), and the years of experience in the

intensive care unit, the finding display has (6 and less than) years (67.5%). Relative to the participation in the training course, the results show that (55.5%) of the sample is participating in the training course and has trained in the training course inside Iraq. Finally, regarding educating yourself within the field of specialization in a self-reliant capacity, the study indicated that (92.5%) answered yes, and (42.5%) of the social network was a source of medical information.

Table (1) Demographic Data of the Study Sample (N= 40 Nurses)

Variables	Groups	F.	%
Gender	Male	18	45.0
	Female	22	55.0
Age (years)	36 and less	27	67.5
	36-46	12	30.0
	46-56	1	2.5
	56 and more	0	0
Educational level	Graduate of Nursing Prep	3	7.5
	Medical Institute	18	45.0
	College of Nursing	18	45.0
	Postgraduate	1	2.5
Monthly Income	less than 300 thousand IQD	5	12.5
	between 300-600 thousand IQD	13	32.5
	Between 600- 900 thousand IQD	20	50.0
	900-1200 million IQD	2	5.0
Years of service in nursing	6 and less than	20	50
	6-11	16	40
	11-16	4	10.0
Years of experience in the intensive care unit, in particular	6 and less than	27	67.5
	6-11	12	30.0
	11-16	1	2.5
Participated to reduce or prevent complications	Yes	22	55.5
	No	18	45.0
If yes, the number of courses	Inside Iraq	22	100.0
	Outside Iraq	0	0
	Total	22	100
Educating yourself within the field of specialization in a self-reliant capacity'	Yes	36	92.5
	No	3	7.5
If the answer is yes, specify the source: Social networking		17	42.5

The internet is solid sites	9	22.5
Experienced fellow nurses	14	35.0

Table (2) Overall assessment of Knowledge about the Complications of Craniotomy at Post-Test (N= 40 Nurses).

Main domains	Response	Statistical Parameters		Mean	SD	Assessment
		F.	%			
Domain1	Fail	31	77.5	4.10	1.905	Fail
	Pass	9	22.5			
Domain2	Fail	38	95.0	2.62	1.530	Fail
	Pass	2	5.0			
Domain3	Fail	40	100.0	1.22	0.422	Fail
	Pass	0	0			
Overall assessment	Fail	36	90.0	10.82	3.272	Fail
	Pass	4	10.0			

The mean of the Score: (0.50). Fail = (mean less than 0.50) Pass= (mean 0.50 or more)

Table (3) shows that the majority overall assessment of the study sample responses at the pre-test is "fail" with a statistical mean equal to 10.82.

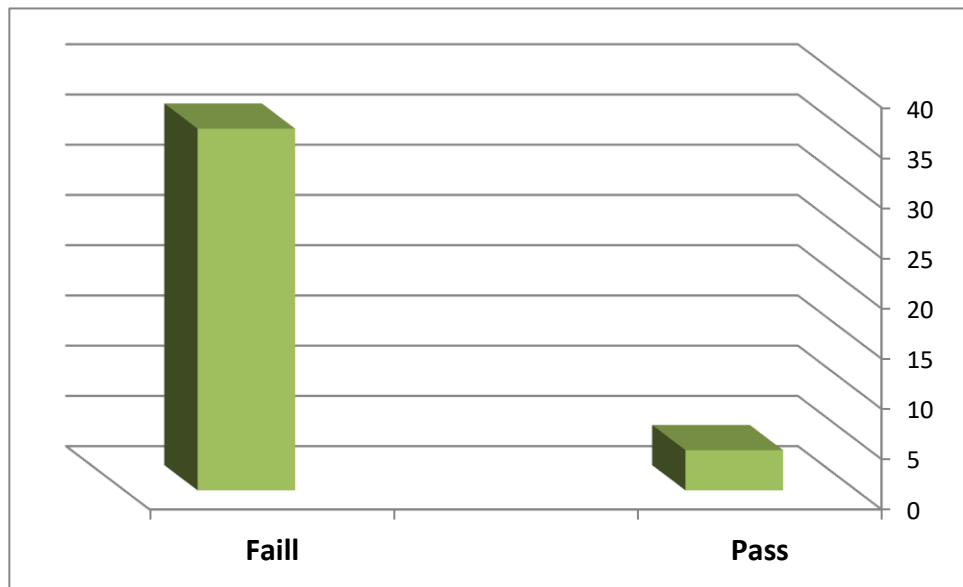


Figure (1) Overall assessment of the study sample responses Pre-test.

Figure (1) indicated that the majority overall assessment of the study sample responses at the pre-test is "fail" with a statistical mean equal to 10.82).

Table (2) of Overall Assessment of Knowledge about the Complications of Craniotomy at Post-Test (N= 40 Nurses)

Main domains	Response	Statistical Parameters		Mean	SD	Assessment
		F.	%			
Domains1	Fail	0	0	9.4000	1.53902	Pass
	Pass	40	100			
Domains2	Fail	0	0	9.4000	.81019	Pass
	Pass	40	100.0			
Domains3	Fail	0	0	9.5750	.67511	Pass
	Pass	40	100.0			
Overall assessment	Fail	0	0	28.1	2.06062	pass
	Pass	40	100.0			

The mean of the Score: (0.50). Fail = (mean less than 0.50) Pass= (mean 0.50 or more)

Table (2) shows that the majority overall assessment of the study sample responses at the post-test is "pass" with a statistical mean equal to 28.1.

Table (3) The Differences between pre and post-test toward Knowledge about the Complications of Craniotomy and their Domains of study at Pre and post-level of measurements(N= 40 Nurses)

Domains	Period of test	Mean	SD	Test	p-value
information on nurses' knowledge of craniofacial operations	Pre-test	4.10	1.905	12.975	0.000(S)
	Post-test	9.1250	1.539		
nurses' knowledge about the complications of craniotomy	Pre-test	2.62	1.530	24.77	0.000(S)
	Post-test	9.4000	.81019		
the knowledge of nurses towards nursing care for patients with craniofacial operations and its complications	Pre-test	1.22	0.422	66.292	0.000(S)
	Post-test	9.5750	.67511		
Overall assessment of knowledge about the complications of craniotomy	Pre-test	10.82	3.272	28.244	0.000(S)
	Post-test	28.1000	2.06062		

S: Significant association (P <0.05)

Table (6) display significant differences between pre and posttest toward knowledge about the complications of craniotomy and their domains of study p value =(0.000, 0.000,0.000,0.000) (P-value = 0. 01) at the (P ≤ 0.05) level of significance

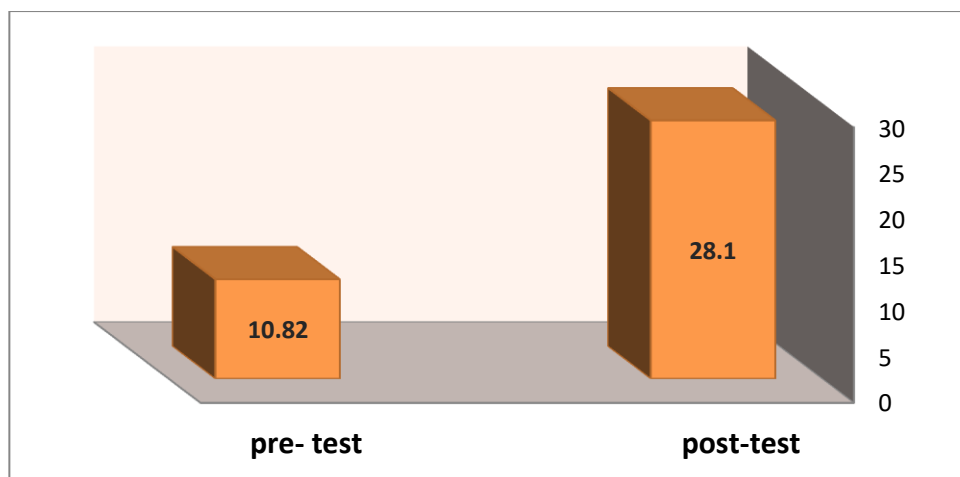


Figure (2) Overall assessment of the study sample responses at pre and post-test.

Table (4) Determining the Relationship between Knowledge about the Complications of Craniotomy among Staff Nurses toward their Socio-Demographic Characteristics.

Demographic data	Rating	F.	%	Chi-Square Tests	p-value
Age	36 and less	27	67.5	$X^2 = 33.5^a$ Df=2	0.015(S)
	36-46	12	30.0		
	46-56	1	2.5		
	56 and more	0	0		
Gender	Male	18	45.0	$X^2 = 9.73^a$ Df=1	0.136(N.S)
	Female	22	55.0		
educational level	Graduate of Nursing Prep	3	7.5	$X^2 = 46.6^a$ Df=3	0.00(S)
	Medical Institute	18	45.0		
	College of Nursing	18	45.0		
	Postgraduate	1	2.5		
years of service in nursing	6 and less than	20	50	$X^2 = 15.1^a$ Df=2	0.237(N.S)
	6-11	16	40		
	11-16	4	10.0		

F: Frequency %: Percentage X^2 : chie-square-test, S: significant, df: degree of freedom, N.S: not significant

Table (4) shows the relationship between Knowledge about the Complications of Craniotomy among staff nurses and their socio-demographic characteristics. Regarding this table reveals that is a relationship between age and Knowledge about the Complications of Craniotomy and educational level. (P-value = 0.015, 0.00) at the ($p \leq$

0.05) level of significance. Concerning gender and Knowledge about the Complications of Craniotomy and years of service in nursing the result shows that no relationship between them. (P-value = 0.136, 0.237) at the ($p \leq 0.05$) level of significance.

Discussion:

Discussion of the Socio-demographic Characteristics of the Studied Sample (Table 1):

Through the data analysis of the distribution of the socio-demographic variables, (Table 1) reveals that approximately more than half of the study sample (55%) were female. This finding was in agreement with those of found in a study entitled (Effectiveness of an Instructional Program on Nurses' Performance toward Unconscious Patients' Personal Hygiene in Intensive Care Unit at Teaching Neurosurgical Hospital in Baghdad City) where was the majority of the sample (66.7%) is female (11). other study According to Abbas and Mua'ala (2018), their study indicated that more than half of the study samples, specifically 56.5%, were female. The study focused on the impact of an education program on nurses' knowledge regarding children under mechanical ventilation at pediatric teaching hospitals in Baghdad City. Regarding the age group for the study sample (36 and less) years old (67.5 %), This result disagrees with a study done by(12), who found in a study entitled "Qualitative Research in Nursing and Healthcare" that most of the nurses were in the age group ranged from 25<35 years. Concerning the level of education, the results revealed that less than half of the sample (45%) are from medical institutes and colleges of nursing degrees that disagree with the study done by(18), the highest number of nurses in both the study and control groups, accounting for 80% of the participants, were secondary school graduates. On the other hand, the lowest numbers were seen among institute and college graduates. The study focused on the impact of an educational program on nurses' knowledge and practices regarding neurogenic bladder rehabilitation for spinal cord injured persons. the results in the current study show that (55.5%) of the sample participating in the training course and has trained these results to agree with a study done by(9)The majority of the study sample (52%) has participated in training courses about traumatic head injuries. On the other hand, According to a study the evaluation of nurses' practices toward postoperative wound dressing in surgical wards revealed a strong positive relationship between the quality of nurses' performance and their level of education. The study found that nurses who had participated in training sessions performed the same practices as their counterparts who had not undergone such training. according to years of experience(1) the study shows that most of the nurses with less than 5 years which is agree with study done by 19(2018), the findings of their study revealed that the highest percentage, specifically 54.3% of the participants, had 1-5 years of experience in hospitals. The study focused on the effectiveness of a teaching program on nurses' knowledge concerning the side effects of chemotherapy among children with leukemia at oncology wards in Baghdad City

(19) Table (2) shows that the majority overall assessment of the study sample responses at the pre-test is "fail" with a statistical mean equal to 10.82

In a study conducted by(13) titled "Effectiveness of an Educational Program on Nurses' Knowledge Concerning Side Effect of Radiotherapy at Al-Amal National Hospital for Cancer Management in Baghdad City" (citation provided), the researchers assessed the impact of an educational program on nurses' knowledge of the side effects of radiotherapy. The study included a study group and a control group.

According to the findings, a high percentage (80.0%) of participants in the study group obtained poor scores on the pre-test. The mean score for this group was 55, although the standard deviation was not provided (14).

Similarly, in the control group, a significant percentage (76.7%) of participants also achieved poor scores on the pre-test. The mean score for this group was 55.8, with a standard deviation of 0.430 (13).

The purpose of the study was to evaluate the effectiveness of the educational program in enhancing nurses' knowledge of the side effects associated with radiotherapy. The pre-test scores indicate that both groups had a poor level of knowledge before the intervention of the educational program (13)

(3) shows that the majority overall assessment of the study sample responses at the post-test is "pass" with a statistical mean equal to 28.1 this study agrees with a study conducted by (6) titled "Effectiveness of an Education Program on Nurses' Knowledge toward Enteral Nutrition Support for Unconscious Patients at Critical Care Unit in Imam Al-Hussein Medical City in Holy Karbala" assessed the overall assessment of study sample responses at the post-test. The study found that the majority of the participants demonstrated a "pass" level of knowledge, with a statistical mean of 28.1 (6). This study aligns with the findings mentioned previously, indicating a similar result regarding the overall assessment of study sample responses at the post-test. It further supports the notion that a significant proportion of the participants achieved a passing score and exhibited an improvement in knowledge after undergoing the educational program(6).

According to (19), in their study titled "Assessment of Nurse's Knowledge about the Care of children treated with Ventricular Peritoneal Shunt" published in the Mosul Journal of Nursing,

it was found that two-thirds of nurses had not received training courses specifically focused on VP shunt care. The study further revealed that the overall knowledge of nurses regarding VP shunt care was assessed as poor(13) Assessment of nurse's knowledge about the care of children treated with Ventricular Peritoneal Shunt in table (4) display significant differences between pre and post-test toward knowledge about the complications of craniotomy and their domains of study p value =(0.000, 0.000,0.000,0.000) (P-value = 0. 01) at the ($P \leq 0.05$) level of significance. According to (10)in (2015), the educational program focusing on pre and post-operative nursing management was associated with a significant increase in the knowledge of the study group. Their study, which assessed the mean scores and relative sufficiency of nurses' knowledge in pre and post-tests, demonstrated a high level of knowledge among nurses following the implementation of the educational program for the study group.in the other study According to (16)in (2020), their study demonstrated a highly significant difference in the overall responses of the study group between the pre-test and post-test measurements. The findings indicated an improvement in nurses' knowledge regarding nursing management for patients undergoing percutaneous coronary intervention at the cardiac center in Al-Dewaniyah City.

Table (4) shows the relationship between Knowledge about the Complications of Craniotomy among staff nurses and their socio-demographic characteristics. Regarding this table reveals that is a relationship between age and Knowledge about the Complications of Craniotomy and educational level. (P-value = 0.015, 0.00) at the ($p \leq 0.05$) level of significance. The current study agrees with the study done by showing that there is no statistically significant relationship just between the nursing staff's knowledge and demographic data (age, and years of experience in CCU, RCU; medical and surgical wards).In another study conducted by(7) in(2023), the results demonstrated a significant association between years of experience and nurses' knowledge. The findings also revealed a statistically significant relationship between nurses' practices and their compliance with standard precautions. The study highlighted that nurses with more years of employment had accumulated more experience, which ultimately influenced their practices. The research titled "Nurses' Knowledge and Practice Regarding Prevention of Surgical Site Infection at Governmental Hospitals in Wasit City, Iraq 2022" Concerning

gender and Knowledge about the Complications of Craniotomy and years of service in nursing the result shows that no relationship between them. (P-value = 0.136, 0.237) at the ($p \leq 0.05$) level of significance. According to (10) in (2023), their study titled "Evaluation of Nurse's Practice for Patient with Craniotomy after Discharge in Baghdad Teaching Hospitals" found that the majority of nurses had poor practice when it came to caring for patients with craniotomies. The study also revealed that there was a non-significant association between nurses' knowledge and their gender and age. However, a significant association was observed between nurses' knowledge and their educational level. According to the study conducted by Jadeo, (10) in (2013) titled "Assessment of Nurse's knowledge concerning Glasgow Coma Scale in neurosurgical wards" published in the Kufa Journal of Nursing Science, it was found that there was a non-significant relationship between nurses' knowledge and their age. The p-value associated with this relationship was reported as 0.515, indicating no statistical significance. Other study agreed with present findings, According to 19 (2018), the results of their study indicated that there was no significant association between gender and nurses' knowledge regarding the side effects of chemotherapy among children with leukemia. The p-value was found to be greater than 0.05, suggesting no statistically significant relationship. The study focused on the effectiveness of a teaching program on nurses' knowledge concerning the side effects of chemotherapy among children with leukemia at oncology wards in Baghdad City

Conclusion:

Most of nurses in surgical units had knowledge deficit concerning management of complications of craniotomy. There were differences between the knowledge in pre and posttest there is an improvement in the knowledge of the nurses after exposure to an educational program concerning management of complications of craniotomy. The effectiveness of program show strong difference between the nurses' knowledge during the post-test.

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