Nurses' Performance for Caring of Patients during the First 48 Hours Post Brain Tumors Craniotomy

Fatin Mostafa Abd Elhaleem[1], Hanan Sayed Ali[2], Basma Mohammed Khalil[3],
[1]High nurse at Fayoum University Hospital,
[2]Professor of Medical Surgical Nursing, Faculty of Nursing, Ain Shams University,
[3]Assistant Professor of Medical Surgical Nursing, Faculty of Nursing, Ain Shams University.

Abstract

Background: A brain tumor craniotomy patients postoperative admitted to intensive care unit and need for regular monitoring of the overall condition during the first 48 hour so the critical care nurses play an important role in caring for patients of craniotomy, through Regular monitoring of the overall condition and reporting any deviations in health status during the first 48 hour after surgery. **Aim of study**: This study aims to assess nurses' performance for caring of patients during the first 48 hours post brain tumor craniotomy. **Research design:** A descriptive exploratory research design was utilized to achieve the aim of the present study. **Setting:** The current study was carried out in ICU at El Fayoum university hospital. **Subject:** Convenient sample of all available nurses approximately (40). **Tools of data collection**: First tool: Nurses' self-administered questionnaire to assess nurses level of knowledge regarding care of patients during the first 48hr post brain tumors craniotomy**.** Second tool: Nurses' observational checklist to assess nursing actual practice regarding care of patients during the first 48hr post brain tumors craniotomy **Results:** The results of this study revealed that 55% of studied nurses had a satisfactory level of total knowledge regarding the brain tumor craniotomy, while 45% of them had unsatisfactory level of total knowledge. And as regards the total practice 65% of them had a satisfactory level of practice, while 35% of them had unsatisfactory level of total practice. **Conclusion:** It more than half of studied nurses had a satisfactory total level of knowledge about care of Patients postoperative brain tumor craniotomy. And as regards the total nurses practice level post brain tumor craniotomy about two thirds of them had a satisfactory level of practice. Additionally there was no statistical significant difference relation between nurses total knowledge level and their different practice care level. **Recommendations**: Providing continuous in-service education for nurses to update their knowledge related to nursing care for care of patient postoperative brain tumor craniotomy.

Keywords: Brain Tumor, Craniotomy, Nurses' Performance.

Introduction:

Brain tumors compose a heterogeneous group of neoplasms that vary widely by site of origin, morphologic features, growth potential, extent of potential invasiveness and tendency for progression, recurrence and treatment response **(Hamer et al., 2020)**.

A craniotomy is a surgical procedure in which a part of the skull is temporarily removed to expose the brain and perform an intracranial procedure. The most common conditions that can be treated via this approach include brain tumors, aneurysms, arterio-venous malformations, subdural empyemas, subdural hematomas, and intracerebral hematomas. Specialized tools and equipment are utilized to remove the section of bone, which is called the bone flap **(Alkhaibary et al., 2020)**.

There are many types of craniotomies is named depending on the skull bone, which is opened. Typical skull bones targeted for craniotomy include the frontal, parietal, temporal, and occipital bones. Depending on the location of the pathology to be addressed, supratentorial or infratentorial (posterior fossa) craniotomies can be utilized **(Fernández-de et al., 2022).**

Caring for a patient with a craniotomy post brain tumor resection requires a multidisciplinary approach with the bedside nurse playing a vital role. Postoperative complications can often lead to permanent neurologic injury if gone unrecognized. Prompt recognition of postoperative neurologic decline by the bedside nurse and timely diagnosis and

intervention by the multidisciplinary team improves patient outcome and subsequent quality of life **(Sheng-Feng, 2020).**

Nurses play a vital role post brain tumor craniotomy through provide information and education to patients and families, nurses have an enormous potential to improve satisfaction and outcomes for patients undergoing these procedures. Thoroughly preparing patients for their surgery and helping them manage their care postoperatively are the key steps in decreasing complications and readmission. The nurse also takes over the role of the counselor and addresses all the concerns of the patient. This role requires constant and repetitive explaining, interpreting the patient's questions, and reinforcing the facts of the procedure to the patient to have a successful outcome. However, this involves training of additional staff in an already resource-starved environment **(Abdelmowla et al., 2021).**

The patients during the 48 hours post craniotomy will need a multidisciplinary closely care. Each member of the team plays a vital role in total recovery of the patient as wellness counseling, Long term hospitalization, ICU experience, brain tumor craniotomy can cause physical and emotional or psychological disturbances. The clinical psychologist play an important role in the emotional wellbeing of the patient, and occupational therapy, Patients having difficulty in fine movements the nurse should be help the patient to become self-dependent for activities of daily life such as dressing, combing hair, buttoning shirt and picking up small objects **(Liu et al., 2020).**

Significance of the study:

Brain tumor significantly impact the lives of patients and families. According to the National Brain Tumor Society (NBTS), there are approximately 700, 000 Americans diagnosed with a primary brain tumor, while 63% are considered benign, 37% are found to be malignant. Data collected show that males have a higher instance of occurrence, accounting for approximately 58%, according to the National Brain Tumor Society. In the year 2020, brain tumors were the 10th leading cause of death, accounting for approximately 18, 020 adults, with 10, 190 being men and 7, 830 being women. The estimated five-year survival rate is approximately 36% under age 40, over age 40 is approximately 21% survival rate. In 2021, an estimated 84, 170 patients will receive a brain tumor diagnosis **(National Brain Tumor Society, 2021)**.

In Fayoum University hospital,the incidence of brain tumors craniotomy from (2021 to 2022) about 290 patient **(Medical Registration and Statistics Office Fayoum university at 2020).**

Aim of the study:

This study aimed to assess nurses' performance for caring of patients during the first 48 hours post brain tumor craniotomy through:

1-Assessment of nurses' knowledge regarding care of patients during the first 48 hours post craniotomy.

2-Assessment of nurses' practice regarding care of patients during the first 48 hours post Craniotomy.

Research questions:

1-What is the nurses' level of knowledge regarding care of patients during the first 48 hours post craniotomy?

2-What is the nurses' level of practice regarding care of patients during the first 48 hours post craniotomy? 3-Is there statistical relation between nurses' level of knowledge and their level of practices?

Subjects and methods:

Research design:

A description exploratory research design was utilized to achieve the aim of the present study.

Setting:

The current study was carried out in Intensive care unit at El Fayoum university

which is located in the 2nd floor. It contains 14 beds, 14 mechanical ventilator and 14 monitors.

Subject:

Convenient sample of all available nurses approximately (40) in intensive care unit at Fayoum university hospital..

Tools for data collection:

Two tools were used in this study:

1-Nurses' Self administered questionnaire (appendixI) **(Hassan, M. (2014):** Nurses' Knowledge and Performance regarding Nursing Care of pre and post Operative Craniotomy in the Neurological Unit at El Ribat University Hospital, Khartoum State. This tool was developed by the researcher in simple Arabic language based on the related literatures and include two parts:

The first part: demographic characteristic of nurses under this study:

It was concerned with assessment of demographic data of nurses as age, sex, level of education, marital status, years of experience and training courses in care of patients during the first 48 hours post craniotomy. The tool Contain nine question in form of closed, open ended and multiple-choice questions.

The second part: Nurses knowledge assessment sheet:

It was used to assess nurses' level of knowledge regarding care of patients during the first 48 hours post craniotomy. It was developed by the investigator in an Arabic language based on reviewing of scientific literature. It consists of 59 questions in form of multiple -choice questions (MCQS). The 59 questions divided into seven (6) parts:

Part I: Nurses information about anatomy and physiology of brain:

This part aimed to assess nurses' knowledge about anatomy and physiology of brain. It includes questions about component of CNS, its parts, location, weighs and function of the brain. It contains eight questions in form of multiple-choice questions (N=8).

Part II: Nurses information about brain tumors craniotomy:

This part aimed to assess Nurses information about brain tumors craniotomy. It includes questions about definition, types, signs, Indications, contraindications of brain tumors craniotomy and duration of brain tumor craniotomy. It contains 6 questions in form of multiple-choice questions (N= 6).

Part III: Important preoperative nursing care of brain tumors craniotomy:

This part aimed to assess: Important preoperative nursing care of brain tumors craniotomy. It includes questions about investigation, preparations, response-bilities and role of nurses care preoperative brain tumors craniotomy. It consisted of 5 questions in form of multiple-choice (N=5).

Part IV: Nurses information about postoperative care for patients with brain tumor craniotomy:

This part aimed to assess nurses' knowledge about post –operative care for patients with brain tumor craniotomy. It consisted of 18 questions in form of multiple-choice (N=18).

Part V: Nurses knowledge about necessary medications post- operative brain tumors craniotomy:

This part aimed to assess nurses' knowledge about necessary medications post-operative brain tumors craniotomy. It consisted of 5 questions in form of multiple-choice (N=5).

Part VI: Nurses knowledge about the complications of postoperative brain tumors craniotomy:

This part aimed to assess nurses' knowledge about the complications of postoperative brain tumors craniotomy. It includes questions about symptoms of increase

intracranial pressure, hypovolemic shock, care of convulsions and seizures. It consisted of 17 questions in form of multiple-choice (N=17).

❖ **Scoring System:**

A scoring system was followed to assess nurses' knowledge about caring of patients during the first 48 hours post brain tumor craniotomy. The tool consisted of 59 questions, the right answer was scored with one score and the wrong answer scored as a zero score. These scores was calculated and converted into a number and percentage. The total grade for this part is 59 grades. Then the result was classified into 2 categories (Satisfactory level of knowledge if scores ≥70%, Unsatisfactory level of knowledge if scores <70%).

II. Nurses observational checklist (Appendix II):

It was developed by the researcher based on the related literature (**ARUNA, R. (2010):** Effectiveness of structured teaching programme on care of a client with craniotomy during first 48 hours among staff nurses. This tool used to assess nursing actual practice regarding care of patients during the first 48 hours post craniotomy. (It consist of three main parts (Immediate care, nursing care during first 24 hour and nursing care during the next 24 hours (during 48 hr) post -operative brain tumors craniotomy, each part consist of several items and each item contain several steps.

This part aimed to assess actual nursing practice regarding care of patients immediately post craniotomy. It consisted of three parts, the first part contain air way maintenance, breathing, circulation, and assess disability. It consists of (29 step). The second part it consist of measure vital signs it contain (6 steps). The third part it consist of positioning and medication it contain (3steps).

-Nursing care during the first 24 hour

This part aimed to assess nursing actual practice regarding care of patients during the first 24 hour post craniotomy. It consist of (16 item) about assessment of neurologic status, measure vital signs, relieving pain and preventing seizures, care of the patient on mechanical ventilator, wound dressing care, central venous catheter care, urinary catheter care, nasogastric tube care, care of arterial line, monitor fluids and electrolyte level, monitor blood glucose level, monitoring ICP, maintain normal temperature, maintain fluid and electrolyte balance and DVT prophylaxis. Each item it contain several steps.

-Nursing care during the next 24 hour (during 48 hour) postoperative brain tumor craniotomy

This part aimed to assess nursing actual practice regarding care of patients during the next 24 hour post craniotomy it consisted of 5 items which contain (38 Step), about continuous monitoring of general status to patient through (assess vital signs, assess neurological status, maintain hydrating status of the body), diet and oral intake, prevention of wound infection, psychological adjustment and activity .

❖ **Scoring system**:

A scoring system followed to assess nurses' actual practices; where each correct done step was scored as a one grade and not done step was scored as a zero score. These scores was calculated and converted into a number and percentage score. Then the result classified into 2 categories (satisfactory practice if score ≥ 75% and unsatisfactory practice if score < 75%).

Content validity:

Content validity is defined as the degree to which elements of an assessment instrument are relevant to, comprehensively covers the different components and representative of the targeted assessment purpose **(Yusoff, 2019)**, this through group of experts. The tools were revised by a jury of five experts from (two professors and three assistant professors) of the medical surgical nursing staff at the Faculty of Nursing, Ain Shams University. The jury reviewed the tools for its validity, simplicity and applicability, comprehensiveness, accuracy, clarity of sentences and relevance. Minor

modification were done based on the comments of the jury.

Reliability:

Testing reliability of the developed tool was done to measure internal consistency of the tools was tested for their reliability using Cronbach's alpha coefficient test. It was used for total knowledge assessment questionnaire. The internal consistency of the developed tools was tested for their reliability using Cronbach's alpha coefficient test by a statistician to assess reliability of the tools. Reliability of all knowledge perception questionnaire by using Cronbach's alpha coefficient test r= 0.060 and total practice r= 0.75 with p-value<0.001 which reflect the reliability of the tool.

Ethical consideration:

The ethical research consideration included the following:

The research approval was obtained from the ethical research committee at Faculty of Nursing Ain Shams University before initiating the study work and clarified the objectives, aim of the study to nurses included in the study. Oral consent was obtained from nurses before participation in the study, the researcher assured maintaining anonymity and confidentiality of subjects' data and nurses were informed that they are allowed to withdraw from the study at any time without giving any reasons and without penalties.

Pilot study:

A pilot study was carried out on four nurses of the total sample of nurses under study to evaluate the applicability, clarity, efficiency and time needed to fill in each tool. Also, it helped to find the possible obstacles and problems that might face the researcher and interfere data collection. The necessary modifications were done, where some items and questions were omitted and others were added based on the result of the pilot study. The nurses who included in the pilot study were included in the study.

Field study:

- The Collection of data of the current study Continue for four months from September 2022 until the end of December 2022.
- An approval was obtained from hospital directors and nursing directors of Intensive care units in Fayoum university hospital.
- Oral consent was obtained from nurses after explaining the aims of the study.
- The researcher started the interview with each nurse individually using the data collection tools. The researcher visited the study setting 4 days per week Saturday, Sunday, Monday and Tuesday from 9 am to 3 pm to gather data using the previously mentioned tools (one nurses from every shift, with 4 nurses weekly and totally 16 nurses monthly. The time consumed of nurses to fill out the questionnaire ranged from 50-60 minute for each nurse. The actual field work was carried out over a period of three months starting from the first of September 2022 to the end of December 2022. At the beginning, the researcher introduced herself to the studied nurses and explained the purpose of the study to gain their cooperation and to assure the studied nurse about the anonymity of their answers and that the information will be used for scientific research only and was being strictly confidential.

IV. Statistical design:

The researcher started the interview with each nurse individually using the data collection tools. The researcher visited the study setting 4 days per week Saturday, Sunday, Monday and Tuesday from 9 am to 3 pm to gather data using the previously mentioned tools (one nurses from every shift, with 4 nurses weekly and totally 16 nurses monthly. The time consumed of nurses to fill out the questionnaire ranged from 50-60 minute for each nurse. The actual field work was carried out over a period of four months starting from the first of September 2022 to the end of December 2022. At the beginning, the researcher introduced herself to the studied nurses and explained the purpose of the study to gain their cooperation and to assure the studied nurse about the anonymity of their answers and that the information will be used for scientific

research only and was being strictly confidential.

The collection of data was conducted four days per week at morning and afternoon shifts in the previously mentioned all tests were performed at the level of significance as:

- P-value ≤ 0.05 was considered statistically significant.
- P-value < 0.01 was considered statistically highly significant.
- P-value > 0.05 was considered statistically insignificant.

Results:

Table (1): showed that, the mean age among study nurses was (24.4±2.3) years old ranged between (20 and 29) years with 55% of them were males and 45% were females. According to educational level 60% of them were educated in technical institute. For marital status 45% of them were married and 55% were single. Also 50% of the study nurses had experience duration between 1 and ≥5 year, while all of them (40%) of the studied nurses not received training courses about brain tumor craniotomy.

Table(2): Illustrated that that regards to total knowledge (85%) of the studied nurses had a satisfactory total knowledge level as regards anatomy and physiology of the brain, 55% of them had un satisfactory total level of knowledge as regards of brain tumor craniotomy, 80% of the studied nurses had a satisfactory level of knowledge about preoperative nursing care, 10% of the studied nurses had a satisfactory level of knowledge about postoperative brain tumors craniotomy, it was noticed also the total knowledge 90% of the studied nurses had un satisfactory level of knowledge about postoperative brain tumors craniotomy, And as regards the total knowledge 10% of the studied nurses had a satisfactory level of knowledge about postoperative necessary medications, it was noticed also the total knowledge 90% of the studied nurses had unsatisfactory level of knowledge. It was noticed the total knowledge 90% of the studied nurses had a satisfactory level of knowledge regarding postoperative complications and total knowledge score 55% show a satisfactory level.

Table(3): Illustrated that (100%) of the studied nurses had correctly done practice level regarding C (circulation), E (exposure), vital signs and positioning & medication, While only 25% of the studied nurses had a correct done practice level regarding ABCDE.

Table (4): illustrated that all (100%) of the studied nurses were correctly done vital signs in the first 24 hour post brain tumor craniotomy, wound dressing care, monitoring fluids and electrolyte level and monitoring blood glucose level. While no one (0%) of the studied nurses were correctly done about urinary catheter care, care of arterial line and maintain normal temperature.

Table(5) : Illustrated that all (100%) of the studied nurses were correctly done vital signs the next 24 hour (during 48 hours) post brain tumor craniotomy, while 55% of them correctly done prevention of the wound infection.

Figure (1): This figure illustrated that, 30% of the studied nurse had a satisfactory level of practice for immediate care practice, while 65% of them had a satisfactory level in the first 24 hours and regarding the next 24 hour (during 48 h) of postoperative brain tumor craniotomy care (80%) of nurses show a satisfactory level practice, and as regards the total nurses practice level post brain tumor craniotomy 65% of them had a satisfactory level of practice.

Table (6): Showed that there were a statistically significant difference relation between the nurses as regards marital status and years of experience with p-value (**0.01**) **<0.05**, and their total level of knowledge which there were a high significant differences relation between nurses age and their total level of knowledge with p-value (**0.007) <0.001.**

Table(7): Illustrated that there was no statistical significant difference between nurses total practice level and their age, sex, marital status, educational level and years of experience with p-value >0.05.

Table (8): Illustrated that there was no statistical significant difference relation between nurses total knowledge level and their different practice care level (immediate care, first 24 h care, next 24 h care, and total practice care level) with p-value >0.05

Table(9): Illustrated that there was no statistical significant correlation between nurses total knowledge score and different practice care level (immediate care, first 24 h care, first 48 h care, and total practice care level) with p-value >0.05.

Table (1): Number and percentage distribution of socio demographic Characteristics of the Studied Nurses (n=40).

Items	Frequency (N=40)	Percentage %
Age (years)		
Mean ±SD	24.4±2.3	
Range	20-29	
Sex		
Male	22	55%
Female	18	45%
Educational level		
Technical institute	24	60%
Bachelor of nursing	10	25%
Postgraduate	6	15%
Marital status		
Married	18	45%
Single	22	55%
Years of experience		
<1 year	12	30%
1-<5 years	20	50%
≥ 5 years	8	20%
Receive training course about brain tumor craniotomy		
No	40	100%

Table (2): Number and percentage of the studied Nurses total level of knowledge about caring of patients post brain tumors craniotomy.

Knowledge items	Total Knowledge level			
	Unsatisfactory		Satisfactory	
	No.	%	No.	%
Anatomy and physiology of brain	6	**15%**	34	**85%**
Brain tumors craniotomy	22	**55%**	18	**45%**
Important preoperative Nursing care	8	**20%**	32	**80%**
Postoperative brain tumors craniotomy	36	**90%**	4	**10%**
Postoperative necessary medications	36	**90%**	4	**10%**
The postoperative complications	4	**10%**	36	**90%**
Total knowledge level	18	**45%**	22	**55%**

Table (3): Number and percentage distribution of the studied nurses level of practice immediately Post Brain Tumor Craniotomy.

Immediate practice items	Not done		Done	
	No.	%	No.	%
A (Maintain air way patency)	40	100	0	0%
B (Breathing)	24	60%	16	40%
C (Circulation)	0	0%	40	100%
D (Assess disability)	38	95%	2	5%
E (Exposure)	0	0%	40	100%
Total ABCDE	30	75%	10	25%
Vital signs	0	0%	40	100%
Positioning & medication	0	0%	40	100%

Table (4): Number and percentage distributions of the studied Nurses level of practice of during the First 24 hour Post Brain Tumor Craniotomy.

First 24 hours practice care items	24 hours practice level			
	Not done		Done	
	No.	%	No.	%
Assessment of neurologic status	26	65%	14	35%
Measure vital signs	0	0%	40	100%
Relieving pain and preventing seizures	14	35%	26	65%
Care of the patient on mechanical ventilator	28	70%	12	30%
Wound dressing care	0	0%	40	100%
Central venous catheter care	14	35%	26	65%
Urinary catheter care	40	100%	0	0%
Naso-gastric tube care	20	50%	20	50%
Care of arterial line.	40	100%	0	0%
Monitor fluids and electrolyte level	0	0%	40	100%
Monitor infection control measure.	20	50%	20	50%
Monitor blood glucose level	0	0%	40	100%
Monitoring ICP	26	65%	14	35%
Maintain normal temperature	40	100%	0	0%
Maintain fluid and electrolytes balance	32	80%	8	20%
DVT prophylaxis	34	85%	6	15%

Table (5): Number and percentage distribution of the studied nurses level of practice during the next 24 hour (during 48 hour) Post Brain Tumor Craniotomy.

Next 24 hours(during 48 hour) practice care items	Next 24 hours(during 48 h) practice level			
	Not done		Done	
	No.	%	No.	%
Assess vital signs	0	0%	40	100%
Assess neurological status	22	55%	18	45%
Maintain hydrating status of the body:	24	60%	16	40%
Total continuous monitoring of general status to patient	**26**	**65%**	**14**	**35%**
Diet and oral intake	30	75%	10	25%
prevention of wound infection:	18	45%	22	55%
Psychosocial adjustment	36	90%	4	10%
Activity of Immobile patient	40	100%	0	0%
Activity of mobile patient	30	75%	10	25%

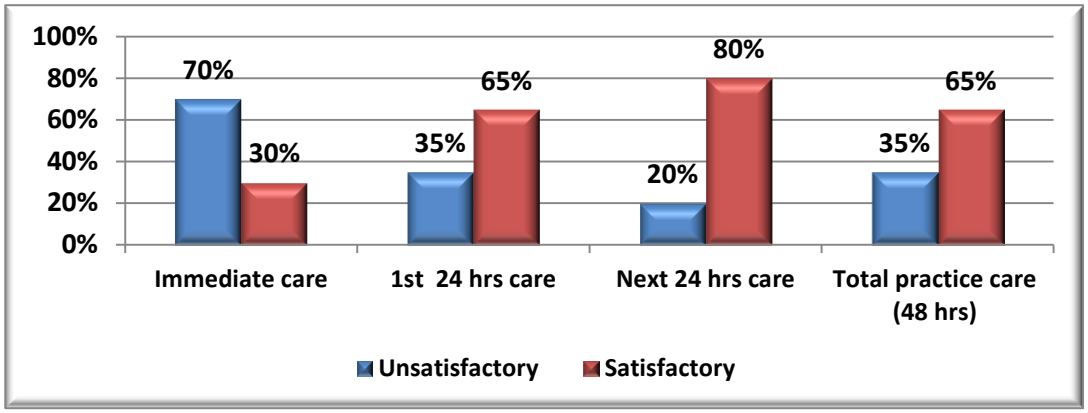

Figure (1): Percentage distribution of total nurses practice level post brain tumor craniotomy.

Table (6) : Relation between the studied nurses' level of knowledge and different demographic characteristics among the studied nurses.

Variables	Knowledge level Unsatisfactory(n=18)	Satisfactory(n=22)	T	P-value	Sig.
Age (years)					
Mean ±SD	23.3±2.1	25.3±2.1	**-2.8**	**0.007**	**HS**
Sex			**X^2**	**P-value**	**Sig.**
Male	8(44.4%)	14(63.6%)	1.5	0.4	NS
Female	10(55.6%)	8(36.4%)			
Professional education					
Technical institute	12(66.7%)	12(54.5%)			
Bachelor of nursing	2(11.1%)	8(36.4%)	3.9	0.1	NS
Post graduate	4(22.2%)	2(9.1%)			
Marital status					
Married	4(22.2%)	14(63.6%)	**6.9**	**0.01**	**S**
Single	14(77.8%)	8(36.4%)			
Years of experience					
<1 year	8(44.4%)	4(18.2%)			
1-<5 years	10(55.6%)	10(45.5%)	**9.02**	**0.01**	**S**
≥10 years	0(0%)	8(36.4%)			

Table (7) :Relation between the studied nurses' care practice level about brain tumors craniotomy and between demographic characteristics among the studied nurses.

Variables	Total care practice level Unsatisfactory(n=14)	Satisfactory(n=26)	T	P-value	Sig.
Age (years)					
Mean ±SD	24.8±2.3	24.1±2.3	0.90	0.4	NS
Sex			**X^2**	**P-value**	**Sig.**
Male	10(71.4%)	12(46.2%)	2.3	0.2	NS
Female	4(28.6%)	14(53.8%)			
Professional education					
Technical institute	6(42.9%)	18(69.2%)			
Bachelor of nursing	6(42.9%)	4(15.4%)	3.8	0.1	NS
Post graduate	2(14.3%)	4(15.4%)			
Marital status					
Married	8(57.1%)	10(38.5%)	1.3	0.3	NS
Single	6(42.9%)	16(61.5%)			
Years of experience					
<1 year	4(28.6%)	8(30.8%)			
1->5 years	6(42.9%)	14(53.8%)	1.02	0.6	NS
≥10 years	4(28.6%)	4(15.4%)			

Table(8):Relation between nurses' knowledge level about brain tumors craniotomy and their level of practice among the studied nurses.

Variables	Knowledge level Unsatisfactory (n=18)	Satisfactory (n=22)	X^2	P-value	Sig.
Immediate care					
Unsatisfactory	14(50%)	14(50%)	0.5	0.94	NS
Satisfactory	4(33.3%)	8(66.7%)			
Care first 24 hours					
Unsatisfactory	4(28.6%)	10(71.4%)	2.3	0.2	NS
Satisfactory	14(53.8%)	12(46.2%)			
Care next 24 hours					
Unsatisfactory	4(50%)	4(50%)	0.1	0.9	NS
Satisfactory	14(43.8%)	18(56.3%)			
Total Care level					
Unsatisfactory	4(28.6%)	10(71.4%)	2.3	0.2	NS
Satisfactory	14(53.8%)	12(46.2%)			

Table (9): Correlation between nurses knowledge scores and care practice scores after brain tumors craniotomy.

Nursing care	Knowledge score		
	R	p-value	Sig.
Total immediate care score	0.15	0.3	NS
After first 24 hours care score	-0.24	0.1	NS
After next 24 hours care score	-0.05	0.7	NS
Total care score	-0.24	0.1	NS

Discussion:

Cancer is one of the most feared chronic diseases, and brain tumors are the most frightening of all forms of cancer because brain tumors are difficult to treat and cause comprehensive systemic effects due to neurological damage, compared to other cancers. In addition to the impact of the tumor itself, patients with brain tumors may experience physical, psychological, social, and cognitive changes during and after treatment as well. These changes are challenging for patients to overcome alone, and their health care providers are also burdened and stressed. The health care provider's burden and stress ultimately affect the patient's health and their likelihood of survival **(Jung et al., 2023).** Caring of patient with craniotomy require a multidisciplinary approach with the bedside nurse play a vital role. Postoperative complication can often lead to permanent neurologic injury if gone unrecognized. Prompt recognition of postoperative neurologic injury decline by the bedside nurse and timely diagnosis and intervention by multidisciplinary team improves patient outcome and subsequent quality of life **(Clement et al., 2019)**

Regarding demographic characteristics of the studied nurses.

The present study showed that the mean age among study nurses was (24.4±2.3) years old ranged between (20 and 29) years. These results were agreed with **Pervaiz, & Yousef, (2021)** who applied study in Lahore Pakistan entitled "Knowledge and practice of Nurses' about post operated pain management at neurosurgery department in Tertiary Care Hospital, Lahore. Pure and Applied Biology" who stated that mean age among study nurses was (1.53±.577) years old ranged between (20 and 30) years**.**

As regard to the gender, the results revealed that, more than half of the studied nurses were males, less than half of them were married while more than half of them were single. This may be due to that the less than half of the study subjects were over twenty years and according to the Egyptian society culture, by this age most of people are married.

These findings were contradicting with **Kreem et al., (2019)** who applied study in Kufa, Iraq entitled "Effectiveness of educational program on nurses' knowledge regarding pre and post-operative nursing management" and found that highly percentage of the studied nurses were male while less than half of them were single.

According to educational level, the result

The results revealed that, less than two thirds of the studied nurses were educated in technical institute. From the investigator point of view, this may be because many bedside nurses in governmental hospitals graduated from the nursing technical institute.

The current findings were contradicting with a study in Jordan done by with **Alnajar et al., (2019)** who applied a study in Jordan entitleded "Knowledge and attitudes toward cancer pain management among nurses at oncology units. Journal of Cancer Education" and revealed that the majority of the studied nurses had Bachelor degree in nursing

Furthermore, the study stated that half of the study nurses had experience duration between 1 and <5 year, While no one of the studied nurses received training courses about brain tumor craniotomy. This result may be due to the studied nurses age ranged between (20

and 29) years. From the investigator point of view this finding may be because most nurses may have lack of time, heavy workload in their units, no availability of training program produced to them from hospital which may be the reason behind

These findings were similar to **Clement et al., (2019)** who applied study entitled "Effectiveness of SIM on Care of Patient with Craniotomy among Staff Nurses Working in Neurological Units. International Journal of Medical Surgical Nursing" and reported that less than half of the studied nurses had experience from 1 to 5 years and less than two thirds of them didn't attend any program regarding care of patient with craniotomy. While were supported with **Ammash, & Ahmed,(2023)** who applied study entitled "Effectiveness of an Educational Programe on Nurses knowledge about Craniotomies Complications" and showed that years of experience of the studied ranged from 5 to 15 years (mean= 7.5 years). And disagreed with **Ahmed et al., (2021).** Who applied study entitled "Assessment of Nurses Performance Regarding External Ventri-cular Drain among patients with Brain Tumor. Egyptian Journal of Health Care and revealed that more than two thirds of them attended previous training courses.

As regards total level of knowledge about care of patient postoperative brain tumor craniotomy, more than half of studied nurses had a satisfactory level of knowledge regarding the brain tumor craniotomy, while less than half of them had unsatisfactory level of total knowledge. This could be attributed to lack of interest of hospital administration in conducting educational programs, especially in critical care units caring for patients with brain tumor craniotomy. It is very important to improve their knowledge which affects positively the quality of care for such group of patients.

These results matched with **El-Maksoud et al., (2019)** who applied study in Alexandria Egypt entitled "Impact of a Nursing Educational Program on the Expected Postoperative Outcomes of Patients Undergoing Brain Surgeries" and showed that highly percentage of the studied nurses had unsatisfactory level of knowledge. And supported by **Clement et al., (2019)** who reported that overall knowledge scores regarding care of patient with craniotomy was more than half among studied nurses. While contrasted with **Kreem & Hamza, (2019)** showed that most of nurses in surgical units had knowledge deficit concerning management regarding pre and post-operative nursing management

Assessment of nurse's level of practice during the First 48 hour Post Brain Tumor Craniotomy .

The current study result showed level of practice immediately Post Brain Tumor Craniotomy, all of the studied nurses had correctly done practice level regarding C (circulation), E (exposure), vital signs and positioning & medication, while only one quarter of the studied nurses had a correct done practice level regarding ABCDE. This result may be due to daily care routine post Brain Tumor Craniotomy. These findings in accordance with **Hassan, (2014)** who applied study entitled "Nurses' Knowledge and Performance regarding Nursing Care of pre and postoperative Craniotomy in the Neurological Unit" and noted that the majority of the studied nurses perform patients position, and perform vital signs postoperative craniotomy postoperative craniotomy. While this result was contrasted with **Glanville et al., (2021)** who applied study entitled "Evaluation of the effectiveness of learning program in the nursing observation and assessment of acute surgical patients" and revealed that not all nurses performed comprehensive ABCDE assessment. And **Umuhoza et al., (2019)** who applied study in Rwanda entitled "perceived knowledge and practices of nurses regarding immediate post-operative pain management" and revealed that less than half of the studied nurses frequently measure vital signs postoperative.

As regard nurses level of practice of during the First 24 hour Post Brain Tumor Craniotomy As regard nurses level of practice of during the First 24 hour Post Brain Tumor Craniotomy, the current study illustrated that all of the studied nurses were correctly measuring of vital signs, wound dressing care, monitoring fluids and electrolyte level, while no one of the

studied nurses were correctly done about urinary catheter care, Less than two thirds of them Assessing of neurologic status, half of them monitor infection control measure while less than two thirds of them didn't relieving pain and preventing seizures

These findings were contrasted with **Jasim et al., (2023)** who applied study done in Baghdad entitled "Evaluation of Nurse's Practice for Patient with Craniotomy after Discharge in Baghdad Teaching Hospitals" and revealed that more than two thirds of the studied nurses not apply folly catheter for patient. And similar with **El-Maksoud et al., (2019)** who showed that half of the studied nurses applying infection control measures, the majority of them dealing with seizures and most of them applying pain management while two thirds of the studied nurses had poor level of practice regarding care of wound incision, all of them didn't assessing of neurologic status. And agreed with **Pervaiz & Yousef, (2021)** who reported that the majority of the studied nurses measuring vital signs post brain tumors craniotomy

While contrasted with **Gizaw According studied nurses level of practice during the next 24 hour (during 48 hour) Post Brain Tumor Craniotomy,** the current study result found that all of the studied nurses were correctly done vital signs the next 24 According studied nurses level of practice during the next 24 hour (during 48 hour) Post Brain Tumor Craniotomy, the current study result found that all of the studied nurses were correctly done vital signs the next 24 hour (during 48 hour) post brain tumor craniotomy, while more than half of them correctly done prevention of the wound infection. From the investigator point view this result may be due to normal daily routine of ICU and application of infection control measures (protocol) in intensive care unit.

This study conducted with **Ayamba et al., (2022**) who applied study In Cameroon entitled "Nurses' Knowledge and Practices on Surgical Site Infections" and revealed that the majority of the studied nurses done good practice regarding prevention of the wound infection.

While these findings were contradicted with **Rongurliani (2022)** whoapplied study entitled "A Study to Assess the Effectiveness of Plan Teaching Program on Care of Craniotomy Wound among Staff Nurses in Selected Neurological Hospital" and concluded that the studied nurses had unsatisfactory level of knowledge and skills regarding of staff nurses regarding care of craniotomy wound. And contrasted with **El-Maksoud et al., (2019)** who found that slightly more than two fifths of the studied nurses Applying poor infection control measures during 1 st observation and two thirds of them performed good care of wound incision and most of them perform good care of wound drain during 2nd observation hour (during 48 hours) post brain tumor craniotomy, while more than half of them correctly done prevention of the wound infection. This result may be due to normal daily routine of ICU and application of infection control measures (protocol) in intensive care unit.

These findings were contradicted with the study done by **Rongurliani (2022)** who concluded that the studied nurses had unsatisfactory level of knowledge and skills regarding of staff nurses regarding care of craniotomy wound before teaching program.

Regarding total nurses practice level post brain tumor craniotomy, the current study result illustrated that, less than one third of the studied nurse had a satisfactory level of practice for immediate care practice, while about two thirds of them had a satisfactory level in the first 24 hours and regarding the next 24 hour of postoperative brain tumor craniotomy care most of nurses show a satisfactory level practice, and as regards the total nurses practice level post brain tumor craniotomy about two thirds of them had a satisfactory level of practice.

From the investigator point of view this result may be due to level of satisfactory knowledge about care of patient postoperative brain tumor craniotomy which affect on practice level.

The current study findings were contradicted with a study done in Egypt by **Ahmed et al., (2021)** and found that more than three quarters of studied nurses were competent

in caring of external ventricular drain with brain tumor while, less than one quarter of them were incompetent.And disagreed with **Jasim et al., (2023)** who found that the majority of the nurses had poor practice concerning patient with craniotomy. Also **Twahirwa, (2019)** who applied study entitled "Assessment of nurses' knowledge and practice on measures to prevent increase in intracranial pressure among neurosurgical patients" and showed that most of the studied nurses had Poor practice regarding prevention of increased intracranial pressure among neurosurgical patients.

Regarding the Relation between the studied nurses' level of knowledge and demographic characteristics: The current study result showed that there were a statistically significant difference relation between the nurses as regards marital status and years of experience with p-value (0.01) <0.05, and their total level of knowledge which there were a high significant differences relation between nurses age and their total level of knowledge with p-value (0.007) <0.001. It may be due to the higher the education level and age, the satisfactory knowledge becomes

. These findings were incongruent with **Shehab et al., (2018),)** who applied study done in Suez Canal Egypt entitled "Impact of an educational program on nurses' knowledge and practice regarding care of traumatic brain injury patients at intensive care unit" and found that there were no statistical significant differences between nurses' total knowledge and their age & years of experience. And disagreed with **Jasim et al., (2023)** found that there was non-significant association between the nurse's knowledge and their gender and age but there is significant association between nurse's knowledge and educational level

In relation between the studied nurses' care practice level about brain tumors craniotomy and between demographic characteristics among the studied nurses, the findings of the present study showed that, there was no statistical significant difference between nurses total practice level and their age, sex, marital status, educational level and years of experience with p-value >0.05. These findings in agreement with **Ahmed et al., (2021)** revealed that, there was no statistical significant differences between nurses' total practices and their characteristics.

Regarding relation between nurses' knowledge level about brain tumors craniotomy and their level of practice among the studied nurses, there was no statistical significant difference relation between nurses total knowledge level and their different practice care level (immediate care, first 24 h care, next 24 h care, and total practice care level) with p-value >0.05. These result contrasted with **El-Maksoud et al., (2019),** who showed that there were a statistical significant differences between nurses' knowledge and skills before and after application of the nursing educational program

Regarding correlation between nursing knowledge scores and care practice scores after brain tumors craniotomy, there was no statistical significant correlation between nurses total knowledge score and different practice care level (immediate care, first 24 h care, first 48 h care, and total practice care level) with p-value >0.05. In the same line with **Ahmed et al., (2021)** who found that there was no correlation between total knowledge and total practices of studied nurses and this

Concerning correlation between nursing knowledge scores and care practice scores after brain tumors craniotomy, there was no statistical significant correlation between nurses total knowledge score and different practice care level (immediate care, first 24 h care, first 48 h care, and total practice care level) with p-value >0.05. In the same line with **Ahmed et al., (2021)** who found that there was no correlation between total knowledge and total practices of studied nurses and this finding was in agreement with those of **Shehab et al. (2018)** who found that there was no correlation between total knowledge and total practices of studied nurses.

Conclusion:

Based on the findings of current study, it can be concluded that, more than half of studied nurses had a satisfactory level of knowledge regarding the brain tumor craniotomy, while less than half of them had unsatisfactory level of total knowledge and this answered the first

question, . Also less than one third of the studied nurse had a satisfactory level of practice for immediate care practice, while about two thirds of them had a satisfactory level in the first 24 hours and regarding the next 24 hour (during 48 h) of postoperative brain tumor craniotomy care, most of nurses showed a satisfactory level practice, and as regards the total nurses practice level post brain tumor craniotomy about two thirds of them had a satisfactory level of practice. and this answered the second question, Additionally there was no statistical significant difference relation between nurses total knowledge level and their different practice care level (immediate care, first 24 h care, next 24 h care, and total practice care level) with p-value >0.05 and this answered the third question.

Recommendations:

Based on the current study findings, the following recommendations

- The training facilitates the learning experience for the staff nurses, the nurse educators need to impart adequate knowledge and inculcate positive attitude toward safe patient care.
- Nurses should be encouraged to attend national and international conferences, workshops, and training courses related to care of patient postoperative brain tumor craniotomy.

Further researches:

- Replication of the current study on a large probability sample from different geographical areas of Egypt to raise the efficiency of nurses, performance in caring for patients with brain tumor craniotomy to achieve more generalized results.
- A similar study can be conducted on various neurosurgical units

References:

Abdelmowla, R. A. A., & Abd-Elmageed, E. S. (2021): Effect of Early Rehabilitation Program on Attention and Balance for Patients following Craniotomy. Assiut Scientific Nursing Journal, 9(27), 170-179.

Ahmed N. A.1, Al-Rafay S. S.2, Hassan S. E.2, AbdEL-hamid A. E.3(2021): Assessment of Nurses Performance Regarding External Ventricular Drain among Children with Brain Tumor. Egyptian Journal of Health Care, 12(3), 945-955.

Alkhaibary A, Alharbi A, Alnefaie N, Oqalaa Almubarak A, Aloraidi A, Khairy S(2020): Cranioplasty: A Comprehensive Review of the History, Materials, Surgical Aspects, and Complications. World Neurosurg. 2020 Jul;139:445-452

Alnajar, M. K., Darawad, M. W., Alshahwan, S. S., & Samarkandi, O. A. (2019): Knowledge and attitudes toward cancer pain management among nurses at oncology units. Journal of Cancer Education, 34, 186-193.

Ammash, E., & Ahmed, S., (2023): Effectiveness of an Educational Programme on Nurses Knowledge about Craniotomies Complications.Migration Letters,20 (S6),286-295.

ARUNA R, (2010): Effectiveness of structured teaching programme on care of a client with craniotomy during first 48 hours among staff nurses at o.g.h. hyderabad, A.P

Clement, I., Marwein, B., & Clement, N. (2019): Effectiveness of SIM on Care of Patient with Craniotomy among Staff Nurses Working in Neurological Units. International Journal of Medical Surgical Nursing, 2(1), 5-14.

El-Maksoud, A., El-Banna, H. M., Tolba, K. G., & Abdelaziz, O. S. (2019): Impact of a Nursing Educational Program on the Expected Post Operative Outcomes of Patients Undergoing Brain Surgeries. Alexandria Scientific Nursing Journal, 21(1), 43-56.

Fernández-de Thomas RJ, De Jesus O. (2022): Craniotomy. [Updated 2022 Apr 9]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK560922

Gizaw, M. A., Negawo, M. K., Bala, E. T., & Daba, D. B. (2022) : Knowledge, practice, and associated factors towards postoperative wound care among nurses working in public hospitals in Ethiopia: A multicenter cross-sectional study in low resource setting area. Health science reports, 5(4), e677.

Glanville, D., Kiddell, J., Lau, R., Hutchinson, A., & Botti, M. (2021): Evaluation of the effectiveness of an eLearning program in the nursing observation and assessment of acute surgical patients: A naturalistic observational study. Nurse Education in Practice, 55, 103152.

Hamer, R. P., Jain, S., Teo, C., Loh, W. N. H., Chan, H. M., Yeo, T. T., & Teo, K. (2020): Optimizing the onco-functional balance in supratentorial brain tumour surgery: A single institution's initial experience with intraoperative cortico-subcortical mapping and monitoring in Singapore. Journal of Clinical Neuroscience, 79, 224-230.

Hassan, M. I. A. (2014): Nurses' Knowledge and Performance regarding Nursing Care of pre and post

Operative Craniotomy in the Neurological Unit at El Ribat University Hospital, Khartoum State, Sudan, 2013 (Doctoral dissertation, University of Gezira).

Hendricks-Ferguson, V. L., Kane, J. R., Pradhan, K. R., Shih, C. S., Gauvain, K. M., Baker, J. N., & Haase, J. E. (2015): Evaluation of physician and nurse dyad training procedures to deliver a palliative and end-of-life communication intervention to parents of children with a brain tumor. Journal of Pediatric Oncology Nursing, 32(5), 337-347.

Jasim, A. H., Jadoe, B. A., & Abd, W. T. (2023): Evaluation of Nurse's Practice for Patient with Craniotomy after Discharge in Baghdad Teaching Hospitals. Scholastic: Journal of Natural and Medical Education, 2(2), 89-95.

Jung, M., Jeong, Y., & Park, B. J. (2023): Adaptation of families of adult patients with brain tumor: Partial least squares structural equation modeling. Plos one, 18(5), e0285677.

Kim, K. T. (2023): The Effects of Spiritual Needs on Spiritual Well-being in Patients with Brain Tumors: A Structural Equation Modeling Approach (Doctoral dissertation, University of Maryland, Baltimore).

Kreem, M. M., & Hamza, R. A. H. (2019): Effectiveness of educational program on nurses' knowledge regarding pre and post-operative nursing management. SCOPUS IJPHRD CITATION SCORE, 10(01), 964.

Liu, B., Liu, S., Zheng, T., Lu, D., Chen, L., Ma, T., & He, S. (2022): Neurosurgical enhanced recovery after surgery ERAS for geriatric patients undergoing elective craniotomy: A review. Medicine, 101(33).

Mohamed, M. A., Mohammed, I. R., & Taha, S. H. (2018). Effect of educational protocol regarding accurate monitoring fluid balance on critical care nurses' knowledge and practice. Minia Scientific Nursing Journal, 4(1), 76-82.

Mohammad, S. S. (2014): Assessment of Nurses Knowledge about Health Education to Patients with Brain Tumors Postoperatively. Mosul Journal of Nursing, 2(2), 79-82.

Pervaiz, H., & Yousef, N. (2021): Knowledge and practice of Nurses' about post operated pain management at neurosurgery department in Tertiary Care Hospital, Lahore. Pure and Applied Biology (PAB), 10(4), 1119-1125.

Ribeiro, M. D. C. D. O., Pereira, C. U., Sallum, A. M. C., Alves, J. A. B., Albuquerque, M. F., & Fujishima, P. A. (2012): Knowledge of doctors and nurses on pain in patients undergoing craniotomy. Revista latino-americana de enfermagem, 20, 1057-1063.

Rongurliani (2022):A Study to Assess the Effectiveness of Plan Teaching Program on Care of Craniotomy Wound among Staff Nurses in Selected Neurological Hospital, Guwahati, Assam International Journal of Science and Research (IJSR) ISSN: 2319-7064 SJIF (2022): 7.942

Shehab, M., Ibrahim, N., & Abd-Elkader, H. (2018): 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. International Journal of Caring Sciences, 11(2): 1104.

Sheng-Feng, S. (2020): The nursing experience of caring a patient with metastatic brain tumor in surgical pain management ward: a case study report. South East Asia Nursing Research, 2(4), 163-172.

Sickder HK, Lertwathanawilat W, Sethabouppha H, Viseskul N (2017). Nurses' surgical site infection prevention practices in Bangladesh. Pacific Rim Int J Nurs Res.;21(3):244-257

Twahirwa, D. (2019): Assessment of nurses' knowledge and practice on measures to prevent increase in intracranial pressure among neurosurgical patients at two selected hospitals (Doctoral dissertation, University of Rwanda).

Wang, J., Cheng, Y., Xu, K., & Zhao, F. (2023): Reduction of postoperative cerebral edema and depression by evidence-based nursing with PDCA cycle in patients with brain tumor after surgery. Journal of Radiation Research and Applied Scienc, 16(3), 100600.