Chronic Subdural Hematoma: Effect of Developing and Implementing Postoperative Nursing Care Standards on Nurses Performance for Reduction or Prevention Postoperative Complications.

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Abstract: Chronic subdural hematoma (CSDH) is one of the most common clinical entities in daily neurosurgical practice. It has been reported to be 1-5 cases per 10,000 of American people per year. Nurses should develop their own standards of care in reducing postoperative complications.The Aim of the study is 3 folds:1. To assess nurses` knowledge and practice regarding patients who had drainage of CSDH 2. Develop postoperative care standards for nurses dealing with patients who had drainage of CSDH 3. Evaluate the effect of implementing postoperative care standards on nurses` performance and patient complications. Quasi experimental research design was utilized in this study .This study was conducted in the neurosurgery department at Assiut University Hospital.A convenient sample of 30 nurses and 73 patients who had drainage of CSDH pre and post implementation of postoperative care standards aged from 18-65 years from both sexes. Four tools utilized for data collection were :1. Nurses performance Regards Care of patients Undergoing CSDH Questionnaire sheet to assess nurses knowledge in addition to some sociodemographic data. 2. Nurses performance Regards Care of patients Undergoing CSDH Observation checklist sheet to assess nurses skills. 3. Patient assessment sheet for CSDH to assess postoperative complications that might develop among all patients admitted to neurosurgery department. 4. Construction of developed postoperative care standards. The results can be concluded as a sharp improvement in the mean knowledge and practice scores were found after implementation of the developed postoperative care standards. As postoperative complications were reduced after implementation of the developed postoperative care standards As a positive relationship was found between nurses` knowledge and practice scores immediately after implementation of the developed postoperative care standards **.** Conclusion: patients who had drainage of CSDH exposed to several complications. Improving nurses` knowledge and practice can favorable affect the incidence of these complications. Recommendations: Nurses in need for in-service training programs and refreshing courses to improve their knowledge which will reflect into their practice while working with patients.

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Key word: Chronic Subdural Hematoma is a common type of intracranial hemorrhage and is predominantly seen in the old age.

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1. Introduction

Chronic subdural hematoma (CSDH) refers to collection of old blood between the dura matter and the arachnoid matter (subdural space). Usually result from seemingly minor head injuries. Clinical symptoms develop 16 days or more after injury when hematoma is enlarged by absorption of fluids from surrounding tissue by osmosis **(Andrews, (2003).**

It is a common type of intracranial hemorrhage and is predominantly seen in the old age. It is one of the most common disorders observed in routine neurosurgical. Prompt diagnosis prevents delays that may lead to increased morbidity in these patients. It is often caused by minor head injury, when rapidly changing velocities within the skull may stretch and tear small bridging veins. Chronic SDH due to head injury is described as traumatic. **(Evans and Tippins, 2008).**

Several studies in United States record the incidence of chronic SDH 1.72 to 13.1per 100.000. The incidence of chronic SDH in patients on warfarin is reported as between 21% and 36% and in 75% of spontaneous chronic SDH, patients are found to be on anticoagulants. SDH is common, after severe head injuries30% of cases. SDH may be acute, subacute or chronic depending on the time frame from injury to clinical symptoms, the size of the involved vessel and the amount of hematoma. SDH is more common in men than in women, with a male-to-female ratio of approximately 3:1 **(Gonogunta and Buxton, 2001)**. In the last 5 years (from 1/1/2005 – 1/1/2010), approximately 700 cases admitted to the neurosurgery department of Assiut University Hospital **(Assiut University Hospital Record, 2005-2010).**

Surgical evacuation of CSDH is indicated for symptomatic lesions including focal deficit and mental status changes or subdurals with maximum thickness greater than 1cm. Surgical management include burr hole, twist drill craniostomy or craniotomy whether or not to use subdural drain and there is not uniform agreement on the best method to treat CSDH **(Takeda et al., 2006).** Postoperative complications of chronic SDH are common in old adult patients and worsening of neurological status following drainage occurs in 4% of patients **(Sakakibara et al., 2011).**

Postoperative complications of chronic SDH include seizures are more common after traumatic brain injury so that patients receive anticonvulsant medication postoperative even if seizures not occur because it liable to occur at any time postoperative **(Wiebe et al., 2001).** Intracerebral hemorrhage is caused by sudden brain shift or misguided irrigation and drainage tubes. Occur in 0.7 – 5 %, one third of these patients die and one third are severely disabled **(Chang and Lowenstein, 2003) .**

Residual neurological problems, seen in different patients which include motor deficits, speech disturbances, bowel and bladder sphincter disturbances, visual disturbances, behavioral and personality changes. Potential complications related to anesthesia, hospitalization, patient age and concurrent medical conditions; blood clots in the legs, heart attacks, reaction to anesthesia, reaction to blood transfusion **(Tornqvist, 2001)**.

Nurses play an important role for patients who had drainage of chronic subdural hematoma because those patients are needed for nursing care standards and education to improve the patients` condition, reducing or preventing postoperative complications, and improve patients` general health **(Sonya, 2007).**

A standard is defined as benchmark of achievement, which is based on a desired level of excellence. It reflects a desired and achievable level of performance against which actual performance can be compared. It provides a guide to the knowledge, skills, judgment and attitudes that are needed to practice safely and help to ensure high quality care. **(Arun, 2009).**

A standard is a model of established practice that is commonly accepted as correct. The care provided by nurses is guided by standards of care. Standards of care were developed and implemented to define the quality of care provided. They are the basis for nursing care and draw on the latest scientific data from nursing literature. Clinical, administrative and academic experts have contributed to the development of standards of nursing practice **(Taylor, 2008).**

A standard of care holds a person of exceptional skill or knowledge to a duty of acting as would a reasonable and prudent person possessing the same or similar skills or knowledge under the same or similar circumstances. Standards of care may serve as guidelines when evaluating nursing care for possible negligence. They define acts that are permitted to be performed from being performed. It gives direction to the nurse defining what should or should not be done for patients **(Bickley, 2007).**

The aim of the study:

The aim of the study is 3 folds: the first aim is to assess nurses` knowledge and practice regarding patients who had drainage of chronic subdural hematoma, the second aim is to develop postoperative care standards for nurses dealing with patients who had drainage of chronic subdural hematoma and the last aim is to evaluate the effect of implementing a postoperative care standards on nurses` performance and patients complications.

Research hypothesis:

To fulfill the aim of the study, the following research hypotheses were formulated:

1- The post mean knowledge scores of nurses was higher than pre mean knowledge scores.
2- The post mean practice scores of nurses was higher than the pre mean practice scores.
3- The incidence of postoperative complications for patients who had drainage of chronic subdural hematoma cared by nurses after postoperative care standards implementation were less than that pre implementation standards.
4- A positive relationship was exist between knowledge and practice score obtained by nurses who had developed postoperative care standards.

Significance of the study

This type of surgery is considered a critical one as the patient is threatened by postoperative complications especially during the first 48 hours postoperatively. In addition to the scarce national researches performed into this area this research could be an attempt to equip this group of nurses with needed knowledge and practices that could contribute to success postoperative.

Also, this study was the first study in Neurosurgery Department at Assiut University Hospital, this geographical location which will help such group of patients to improve nursing care standards, furthermore, result of this study could be helpful for health professional's specialty nurses in

planning and implementing nursing care standards for such group of patients.

2. Subjects and Methods

Research design: Quasi experimental research design.

Setting: The study was conducted in the Neurosurgery Department of Assiut University Hospital.

Sample: A sample of convenience including all available nurses (30 nurses) working in selected area and who are willing to participate in the study, in addition to adult patients who had drainage of chronic subdural hematoma (73 patients) before and after implemented postoperative nursing care standards. Patients selected according to the following:

Inclusion criteria: Postoperative patients who had drainage of chronic subdural hematoma, both sex, age ranged between 18 - 65 years old.

Exclusion criteria: patients on mechanical ventilation.

Tools:

Tool I: Nurses knowledge regards postoperative standard care of patient undergoing CSDH questionnaire sheet: It was translated into Arabic language and modified by researcher to assess their knowledge about postoperative nursing care of CSDH .It was used prior to implementation of the developed postoperative nursing care standards and immediately after the implementation (immediate post-test). It consists of three main parts**:**

Part I: Assess socio-demographic characteristics of the nurses e.g. age, marital status, qualification, years of experience and previous attended training.

Part II: Assess nurses` knowledge about chronic subdural hematoma, it included (30) questions.

Part III: Assess nurses` knowledge about nursing care standards of patient who had drainage of chronic subdural hematoma, it included (15) questions.

Scoring system:

Each right answer was given one score. The total score of questionnaires was less than (50%) were considered having unsatisfactory level. While those who obtained above than (50%) were considered having satisfactory level.

Tool II: Nurses practice regards postoperative standard care of patient undergoing CSDH observation checklist: It was developed and modified by researcher to assess learnt the skills. This tool was used before and immediately after the implementation of the developed postoperative nursing care standards to evaluate the effect of implementing the developed postoperative care standards on nurses` practice.

Scoring system: Each step was observed, categorized and scored as follow: two degree for each step that done correct, one degree for each step done incorrect and zero for step that not done. The total score for all steps was less than (50%) were considered having inadequate level. Above (50%) were considered having adequate level.

Tool III: Patient's assessment sheet for Chronic Subdural Hematoma It was developed by the researcher, Glasgow Coma Scale (SCS) was developed by **Teasdale and Jennette**, **(1974)** can used to assess the patients` conditions (in the first three days) and post operative complications that might develop among all patients admitted to Neurosurgery Department after implementing the developed postoperative care standards. The assessment sheet covered the following parts:

1. Sociodemographic data: age, sex, level of education, occupation and marital status
2. Patients past history of trauma, previous neurological problems.
3. GCS to assess level of consciousness.
4. Postoperative complications that may developed for patients who had drainage of chronic subdural hematoma..

Tool V: Construction of developed postoperative nursing care standards: It was developed by the researcher based on nurses and patients needs assessment, national and international, literature review, and researcher experience. It was revised and modified based on the expertise comments; it was written in Arabic using simple language with illustrations .Basic competencies for postoperative nursing intervention for patients who had drainage of chronic subdural hematoma:

1- Ensure that operating room environment is safe to receive the patient.
2- Ensure that all infection control measures are properly followed in all procedures.
3- Ensure that all preoperative criteria are met for each patient before undergoing surgery.
4- Ensure safety for each patient undergoing surgery.
5- Ensure that continuous monitoring and recording are followed surgery for patients who had drainage of chronic subdural hematoma.
6- Ensure that nursing care is provided for each patient throughout the operative procedures.
7- Ensure that the postoperative criteria are met for each patient.
8- Ensure that patients are properly educated before discharge.

Methods:

- The researcher designed and tested the developed postoperative nursing care standards after extensive

literature review (nursing and medical textbooks, journals, internet resources, etc.) about chronic subdural hematoma and assessment of nurses` knowledge and practice.

- The content validity of the tool and teaching booklet was checked, revised by seven expert professors in fields of medicine staff and medical surgical nursing staff.
- A Pilot study**,** it was implemented on 10% of sample in a selected setting for testing clarity and applicability of the study tools. The purpose of the pilot study was to detect any particular problem in the statements clarity, feasibility, and applicability of the tool. The data obtained from the pilot study were analyzed; no change was done in the assessment sheet, so the 10% of subjects selected for the pilot study were included in the main study.
- To facilitate the implementation of the developed postoperative care standards about chronic subdural hematoma, researcher prepared the training places, teaching aids and media (pictures, handouts). This was followed by arranging for the teaching schedule based on the contents of booklet, number of staff involved, time availability, shifts as well as the resources available.
- An official permission to proceed with the proposed study was obtained from the head of the Neurosurgery department as well as the hospital nursing director.
- At initial interview the researcher introduce herself to initiate communication, explain the nature and purpose of the study and ask nurses to fill out the questionnaire sheet to assess nurses` knowledge before implementing of the developed postoperative care standards and the researcher fill out the observation checklist sheet to assess nurses` skills before implementing of the developed postoperative care standards.
- Also scheduled with them the teaching sessions for both theoretical and practical and the nurses were divided into small groups, each group contains 2 to 4 nurses. Each group of nurses choose the optimal time for receiving the teaching sessions whenever, they have minimal workload.
- Teaching has been implemented for nurses in terms of sessions and teaching on the spot during their official working hours. There were a total of 9 sessions. Number of nurses in each session ranged between 2- 4 nurses. The duration of each session was 30 : 45 minutes, including 10 minutes for discussion and feedback. Each session usually started by a summary of what has been taught during the previous sessions and the objectives of the new topics. Feedback and reinforcement of teaching was performed according to the nurses` needs to ensure their understanding.
- Explain nature and purpose of the developed postoperative care standards to the selected patients who are willing to participate in the study and fill out the patient assessment sheet.
- Evaluate the effect of implementing of the developed postoperative nursing care standards on knowledge and practice on reduction or prevention of postoperative complications .Each nurse obtained a copy of booklet been evaluated by the researcher through filling the tool (I and II). As well as the researcher filled the patient assessment sheet (tool III). The whole period for teaching the implementing of the developed postoperative care standards as well as after two months.
- Informed consent was obtained from nurses and patients who are willing to participate in the study after explanation of the nature and purposes of the study. Confidentiality of the subjects was certainly assured.
- An official letter was issued from the Dean of the Faculty of Nursing to the Head of the Neurosurgery Department to collect the necessary data, and explain the aim and contents of the study to nursing supervisors and physicians to gain their cooperation and allow the release of nurses to attend the teaching sessions during minimal workload activities. Also the meetings with the patient to explain the objectives and contents of this study and obtain informed consent.

Limitations of the study:

1. It was difficult to collect all nurses together at the same time to attend the teaching sessions.
2. Implementation of the developed postoperative nursing care standards takes long periods of time.
3. The length of stay of patients who had drainage of chronic subdural hematoma in Assiut University Hospital maximum 3 days, there is no enough time to compare between incidence of postoperative complications pre and post implementation of postoperative nursing care standards for the same patients.

Statistical design:

Data were collected and analyzed by computer program SPSS. Data expressed as mean, standard deviation, number and percentage. T-test is used to determine significant for numeric variable. Chi-square test is used to determine significant for non-parametric variable. A probability level of 0.05 was adopted as a level of significance for testing the research hypothesis.

3. Results

Frequency distribution of socio demographic characteristics of nurses showed that , the majority of the nurses (86.7%) their age ranged from 20 to 40years with the mean (24.31± 8.42). (90%) of them were females. The majority of nurses were married (60%). Nursing diploma was the highest proportion (83.3%). (40%) of nurses had an experience more than 10 years .While only (10%) of nurses had experience (less than one year). All nurses (100%) had no attending any previous training program about chronic subdural hematoma.

Table (1): Shows that; a highly significant difference between nurses` knowledge in relation to total mean knowledge scores with p- value of <0.0001 in all items.

Table (1): Two by two t-test for the mean total knowledge scores obtained by nurses pre and post implementing developed postoperative nursing care standards(N=30).

Nurses` knowledge about:	Pre test	Post test	P-value
Chronic SDH.	20.33 ± 4.55	35.67 ± 2.33	P< 0.0001***
Postoperative care standards .	11.80 ± 3.56	21.86 ± 2.96	P< 0.0001***
Total score: Maximum score 85	32.13 ± 6.20	57.53 ± 4.54	P< 0.0001***

*** Highlysignificant (P<0.0001).

Table (2): Shows that high significant difference between the level of nurses` practice as regard pre and post developed implementing postoperative nursing care standards with p- value of <0.0001 in all items.

Table (2): Frequency distribution of the level of nurses` practice as regard pre and post implementing developed postoperative nursing care standards (n= 30).

Nurses` practice score	Pre test		Post test		P-value
	No.	%	No.	%	
Inadequate	30	100	-	-	P<0.0001***
Adequate	-	-	30	100	

*** Highly significant (P<0.0001). **N.B.** total score of practice is 203

Table (3): Shows a highly significant difference between nurses` practice in relation to total practice score with p- value of <0.0001 in all items.

Frequency distribution of socio demographic characteristics of patients as regard pre and post implementing developed postoperative care standards showed that, the majority of patients were males in both pre (86.3%) and post (83.56%) implementing developed postoperative care standards. The majority of patients pre (82.2%) and post (79.45%) implementing developed postoperative care standards were having an age ranged from (60-65) years with a mean value of (58.43 ± 7.91 and 57.82 ± 8.31, respectively).

Regarding the patients marital status; the majority of patients were married which include (74%) pre and (68.49%) post implementing developed postoperative care standards. Regarding education; (32.9%) pre and (35.61%) post implementing developed postoperative care standards were secondary education and (32.9%) pre and (34.24%) post implementing postoperative care standards were illiterate. Regarding occupation; (30.1%) of patients pre and (27.39%) post implementing developed postoperative care standards were office work and (31.5%) pre and (27.39%) post implementing developed postoperative care standards were manual work.

Table (3): Two by two t-test for the mean total practice scores obtained by nurses pre and post implementing developed postoperative nursing care standards(n= 30).

Nurses` practice	Pre test	Post test	P-value
Immediate post operative care.	25.53± 0.50	34.00± 2.91	P <0.0001***
Hand washing.	11.73± 2.40	15.2± 0.87	P <0.0001***
Glasgow coma scale.	11.00± 6.74	30.00± 0.00	P <0.0001***
Vital signs.	43.20± 2.04	89.30± 6.57	P <0.0001***
Seizure precautions.	15.00± 0.00	27.56± 0.50	P <0.0001***
Wound care.	30.26± 1.76	51.40± 3.71	P <0.0001***
Instructions before discharge.	8.60± 0.25	38.25± 4.8	P <0.0001***
Total practice: Maximum score364	144.73± 6.41	287.96± 9.79	P <0.0001***

*** Highlysignificant (P<0.0001).

Table (4): Shows that, there was no significant relation between total nurses` knowledge and practice scores pre implementing postoperative nursing care standards with p- value of 0.631 in all items.

Table (4): Relationship between nurses` knowledge and practice pre implementing postoperative nursing care standards (n= 30).

Knowledge score	Practice score				p- value
	Adequate		Inadequate		
	No.	%	No.	%	
Satisfactory	-	-	11	36.7	P = 0.631 n.s
Unsatisfactory	-	-	19	63.3	

Table (5): Shows that, there was highly significant relation (P < 0.0001) between total nurses` knowledge and practice scores post implementing postoperative nursing care standards. Also it was found that all nurses were having satisfactory level of knowledge and adequate practice score (100%).

Table (5): Relationship between nurses` knowledge and practice post implementing postoperative nursing care standards (n= 30).

Knowledge score	Practice score				p- value
	Adequate		Inadequate		
	No.	%	No.	%	
Satisfactory	30	100	-	-	P< 0.0001***
Unsatisfactory	-	-	-	-	

Table (6): Illustrates that, more than half of patients in both pre (63%) and post (65%) implementing postoperative nursing care standards were having previous history of trauma. Also the majority of patients in both pre (78.08 %) and post (75.34 %) implementing postoperative nursing care standards were having dizziness, more than half of patients pre (56.16%) and post (58.90%) implementing postoperative care standards were having persistent headache. As regard for patients` medical history (31.5%) pre and (27.39%) post implementing postoperative nursing care standards were having hypertension.

Table (6): Frequent distribution of patients` medical history pre and post implementing postoperative nursing care standards

Patients` medical history	Pre implementing postoperative care standards (n =73)		Post implementing postoperative care standards (n =73)	
	No.	%	No.	%
1.Previous trauma: Yes	63	86.3	65	89.014
No	10	13.7	8	10.95
2.Previous neurological problems:				
Change in consciousness	21	28.76	19	26.02
Visual disturbances	18	24.65	20	27.39
Speech disturbances	11	15.06	9	12.32
Persistent headache	41	56.16	43	58.90
Dizziness	57	78.08	55	75.34
Vertigo	-	-	2	2.73
Motor deficit	22	30.13	20	27.39
Others	15	20.54	17	23.28
3. Chronic illness:				
Diabetes mellitus	-	-	3	4.10
Hypertension	23	31.5	20	27.39
Cardiovascular disease	4	5.5	4	5.47
Malignancy	-	-	-	-
Others	4	5.5	3	4.10

Table (7): Shows that, there was non significant difference (P=0.122) between GCS of patients as regard pre and post implementing postoperative nursing care standards with a mean value of (13.84±1.34) pre and (14.19±1.32) post implementing postoperative nursing care standards.

Table (7): Comparison between GCS of patients as regard pre and post implementing postoperative nursing care standards

GCS	Pre (n = 73)			Post (n = 73)			P- value
	No.	%	X +SD	No.	%	X +SD	
Mild	52	71.2	13.84±1.34	59	80.8	14.19±1.32	P= 0.122 n.s
Moderate	21	28.8		14	19.2		
Severe	-	-		-	-		

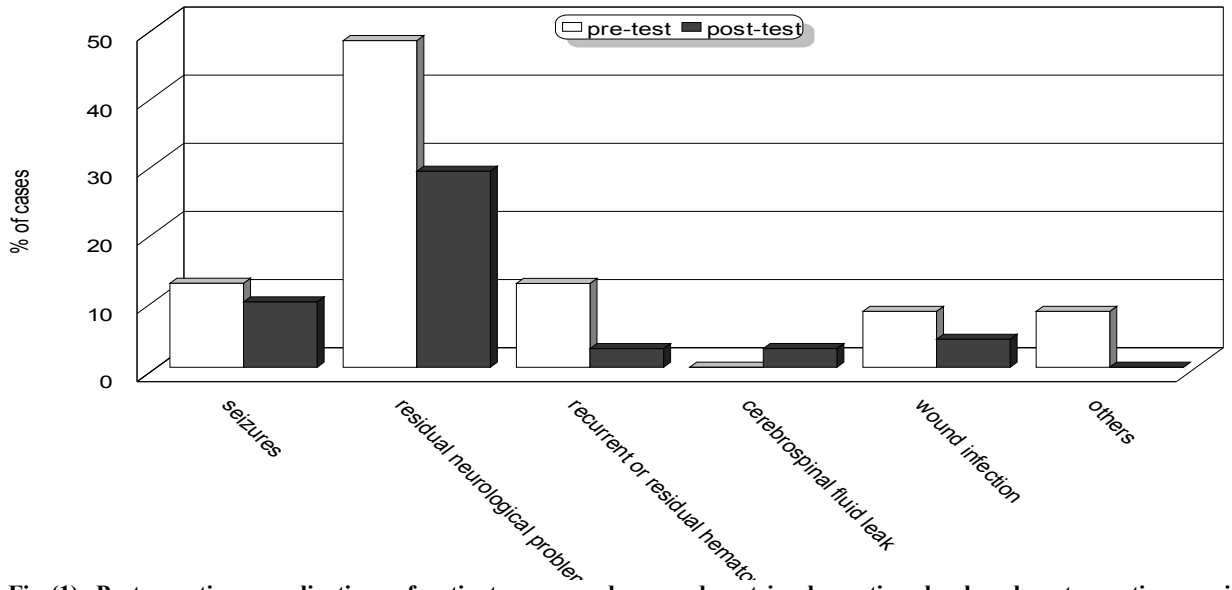

Fig (1): Postoperative complications of patients as regard pre and post implementing developed postoperative nursing care standards.

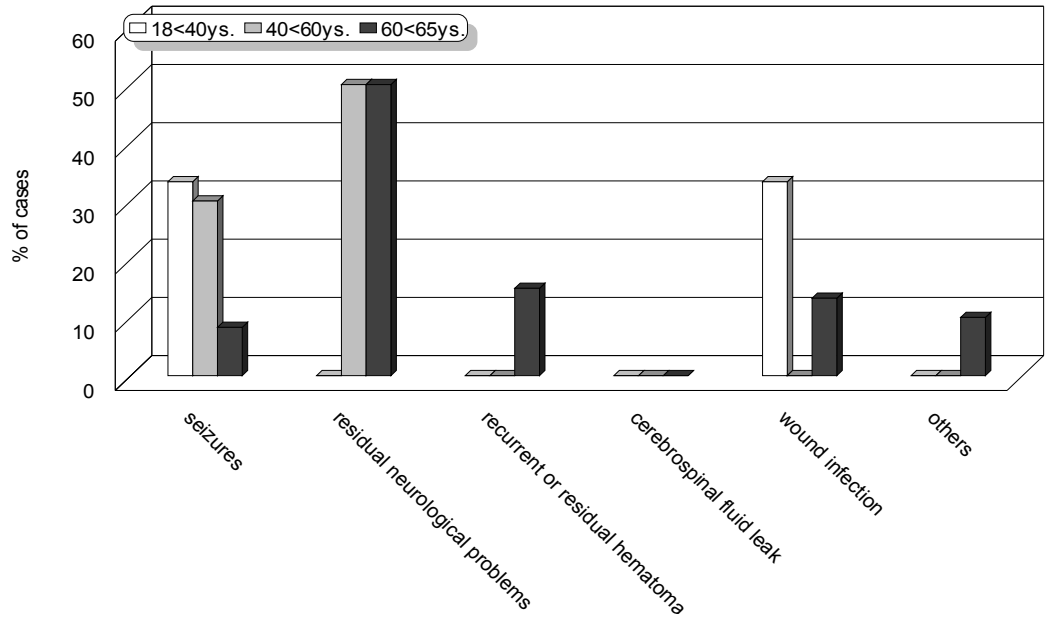

Fig (2): Relationship between postoperative complications and age of patients pre implementing postoperative nursing care standards.

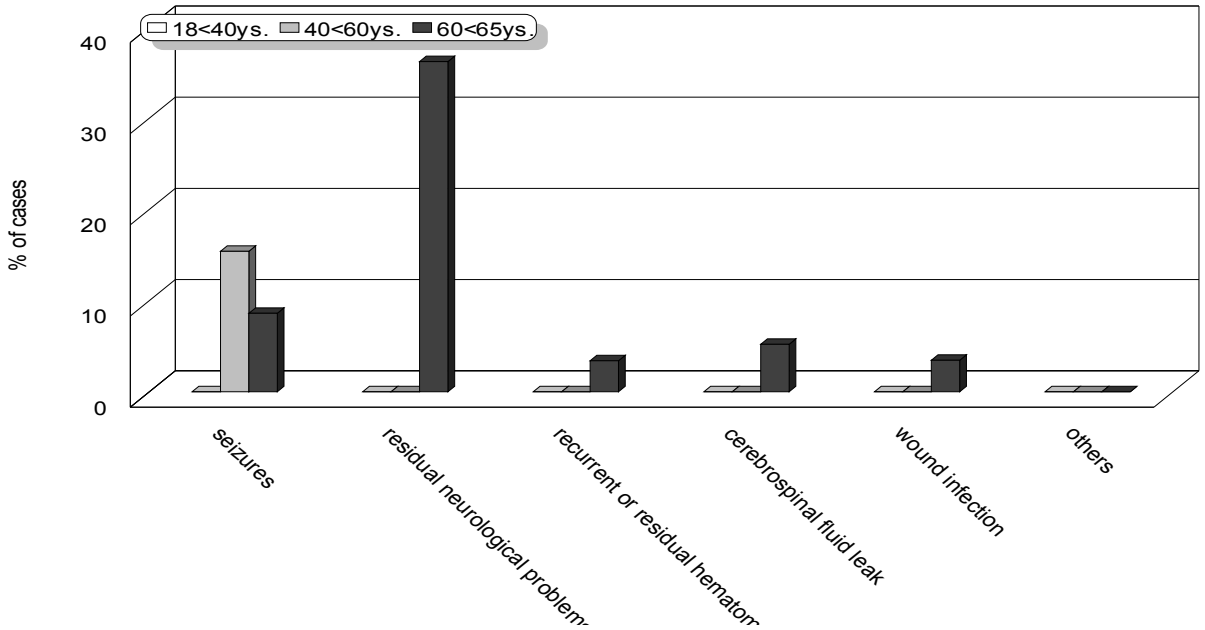

Fig (3): Relationship between postoperative complications and age of patients post implementing postoperative nursing care standards.

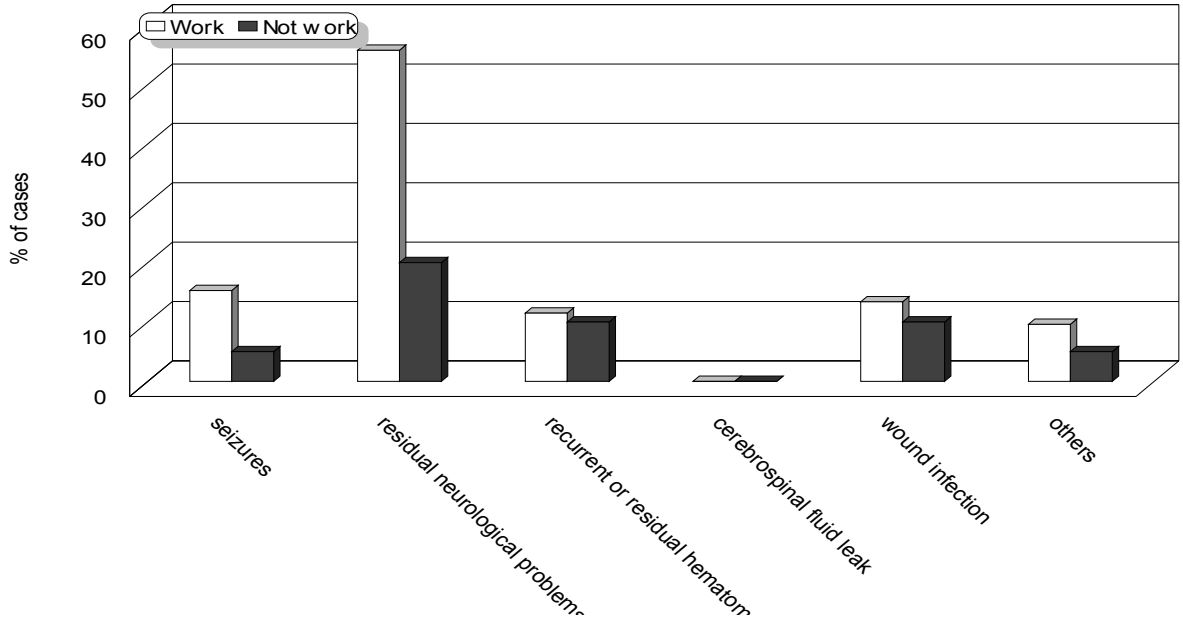

Fig (4): Relationship between postoperative complications and occupation of patients pre implementing postoperative nursing care standards.

4. Discussion

Chronic subdural hematoma is one of the most common clinical entities in daily neurosurgical practice. The diagnosis and treatment are well established, but recurrence, complications, and factors related to these problems, especially in the elderly, are not completely understood (Mori and Maeda, 2011).

The management of chronic subdural hematoma in the adult patient is approached with a variety of different surgical techniques. The trend in recent years has been toward treatment with burr holes or twist-drill holes rather than craniotomy. The rationale for this has been based on the assumption that burr holes and twist-drill holes offer equivalent efficacy and lower morbidity and mortality. This viewpoint is not, however, universally accepted, and many

surgeons feel that craniotomy is superior to a burr hole for the management of this condition (Mark and Bruce, 2011).

Neurosurgery nurse should be qualified enough to care for patients because those patients need special nursing care; standard nursing care to improve their conditions and to help in preventing or reducing potential postoperative complications. Nurses should develop their own standards of care and the profession should agree on acceptable levels of excellence. Nurses are planned, systematic and focused on mutually agreed goals in which standards of care influence nursing practice, education and management (Huston, 2003).

Based on the results of the present study, the majority of nurses were aged from 20 - 40 years. The majority of nurses were female and nursing diploma was the highest proportion, less than half of them have an experience more than ten years and all of them have no in service training courses related to chronic subdural hematoma.

Marquis and Huston, (2009) stated that education and training are two components of staff development that occur after an employees` indoctrination (which refers to planned, guided adjustment of employee to the organization and work environment). The staff knowledge level and capabilities are a major factor in determining the number of staff required to carry out unit goals. The better trained and more competent the staff, the fewer staff required, which in turn saves the organization money and rise reproductively.

The current revealed the most of nurses had unsatisfactory level of knowledge before implementation of developed standards post operative nursing care about chronic subdural hematoma and postoperative nursing care standards for patients who had drainage of chronic subdural hematoma . The majority of nurses in the present study shows unsatisfactory level of knowledge regarding anatomy, definition, causes, risk factors, clinical manifestations, diagnosis, treatment, complications and standards post operative care and health teaching given to patients before discharge. This may be attributed to insufficient courses related to chronic subdural hematoma included in their undergraduate curriculum of nursing education.

Most nurses verbated that their knowledge gained while working with patients. Books that were given to them during their secondary learning years were taken from them at the end of years and there is no Arabic source for updating and continuing their education. Also this may be attributed to lack of continuous education and absence of in-service training program.

Lemon and Burke (2000), stressed on providing standard nursing care for patients who had drainage of chronic subdural hematoma is grounded on a solid foundation of knowledge . Kirsten, (2000), stated that medical surgical nurses must recognize post operative complications that may arise.

After implementation of the standards postoperative care, nurses knowledge score levels regarding patients who had drainage of chronic subdural hematoma were significantly improved. This improvement might be related to the fact that all nurses have a strong desire to learn new knowledge and all nurses in young adult age, this age might have good readiness for learning new things. These results are in agreement with those of Meyer and Elliott (1999) who noted that nurses` knowledge scores were higher among younger and newly graduated nurses who attending training program.

The present study showed significant difference between total nurses` knowledge score with their duration of experience pre and post implementing postoperative care standards and attending previous training program about infection control. Attending training program about infection control help nurses to gain more knowledge about how to provide safe care for patients to prevent or reduce infection and thus the postoperative complications that may result from infection.

As well as, National Institute for Clinical Excellence (2000) stated that nurses with many years of experience may require minimum of additional instructions before they are ready to take a patient assignment, nurses with years of experiences in one clinical specialty may need moderate amount of instructions to acquire through training program.

In the same line a study was conducted in orthopedic department of Assiut University Hospital " by Ghanem (1997), entitled as " Impact of training program on the quality of nursing care to old patients in orthopedic department of Assiut University Hospital" on all nurses working in orthopedic departments which revealed that a statistically significant relation between nurses` knowledge scores with their duration of experience.

The current study showed inadequate level of total practice scores in all items pre implementation of postoperative nursing care standards about postoperative nursing care standards for patients who had drainage of chronic subdural hematoma.

All nurses didn't perform adequate care and didn't do adequate assessment for signs and symptoms of potential complications after evacuation of the hematoma. This may be due to that all nurses didn't have enough information about it and the absence of standard nursing care related to

postoperative patients who had drainage of chronic subdural hematoma.

Marquis and Huston (2009) reported that each organization and profession must set standards and objectives to guide individuals and practitioners in performing safe and effective care. Also not only must standards exit, but leader and managers also must see that subordinates know and understand the standards and employee must be aware that their performance will be measured in terms of their ability to meet the established standards.

The current study revealed a great improvement in the practice score levels obtained by nurses after implementation of postoperative nursing care standards in all items. This has been concluded by the presence of significant differences between results of pre-test and post-test.

Also the present study showed highly significant relation between nurses` knowledge and practice scores post implementing standards postoperative nursing care. This finding indicated that skills can be easily improved, especially if linked with their in relevant scientific base of knowledge.

Youssef, (2007), the same line with the current study findings conducted a study at the reconstructive microsurgical and traumatology care units in Assiut University Hospital. Entitled " Microvascular free tissue transfer surgeries, Impact of a designed teaching protocol on nurse`s knowledge, practices and patient`s outcome" which revealed that an improvement in nurse`s practice after the attendance at continuing nursing education sessions. Research findings indicated that continued nursing education programs increase both knowledge and practice can also improve attitudes.

In this respect, Abd-Ala, (2000), documented that the training program has beneficial effect in improving the nurses` knowledge and skills. They also recommended that educational programs should be organized according to the needs of nurses with continuous evaluation. As well as, Ookalkar, (2009) recommended that educational programs should be organized according to the needs of nurses with continuous evaluation and adopting proper checklists for work monitoring to enhance patient and staff awareness; lead to reduced process errors, mitigating overall risks, eventually resulting in effective patient care.

In the present study the majority of patients were male, married, their age ranged from 60 to 65 years and employ. This study finding was supported by Herbert, (2009), who reported that subdural hematoma (SDH) is more common in men than in women, with a male-to-female ratio of approximately 3:1Patients**.**

As regard to their age this study finding was supported by Greenberg, (2001), reported that chronic subdural hematoma generally occur in the elderly with the average age being 63 years.

In relation to occupation most of patients are employ and having previous history of trauma; employ patients are more liable to head injury than unemployed patients. This study finding agree with the study of Smeltzer and Bare (2004) who reported that chronic subdural hematoma can develop from seemingly minor head injuries and are seen most frequently in the patients over 50 years of age.

Postoperative complications of chronic subdural hematoma include complications related to anesthesia, seizures, residual neurological problems, recurrent or residual hematoma, increased intracranial pressure, wound infection, cerebrospinal fluid leak, meningitis, cerebral abscess, tension pneumocephalus, intra parenchymal hematoma, subdural empyema, speech disturbances, motor deficit, sphincter disturbances and/or others such as personality changes.

The results of the present study showed that implementing developed postoperative nursing care standards help in improving patients` conditions and in reducing postoperative complications in studied patients after implementation of standards postoperative nursing care.

The results of the present study showed that the studied patient's pre implementing postoperative nursing care standards complain from such postoperative complications as seizures, residual neurological problems, recurrent or residual hematoma, wound infection and personality changes in which all of these complications are reduced in the studied patients post implementing standards postoperative nursing care.

The results of the present study showed that there is significant relation between patients' age and postoperative complications; the complications increased with increase in age. This study agrees with the study of Emestus and Lanfermann (2007), entitled as (Chronic subdural hematoma : Surgical Treatment and Outcome) who conducted study on 104 patients which reported that all complications are common in old adult or debilitated patients.

The results of the present study revealed that there is significant relation between patient's occupation and postoperative complications, most of patient with postoperative complications were working. This may be due to that patients who are working especially heavy work are more liable to head injury which is one of the most common causes of subdural hematoma; recurrence of hematoma, return early to work and not taking adequate period

of rest make these patients are more susceptible to develop postoperative complications.

Finally, it can be concluded that, the developing postoperative care standards for patients who had drainage of chronic subdural hematoma achieved objectives by improving nurses` knowledge and practice regarding postoperative care standards for these patients and application of these care by nursing staff help in reducing and or preventing postoperative complications for these patients. This further was supported by Porth, (2000) and Storch and Rice, (2005), who stated that professional nurses have a large role to play in the minimization and prevention of postoperative complications and should be clinically well versed in all aspects of the condition, current strategies to address risk minimization and prevention management and advocates for patient safety.

Conclusion

Based on the result of the present study, it can be concluded that, Patients who had drainage of chronic subdural hematoma are at high risk for postoperative complications which include complications related to anesthesia, seizures, residual neurological problems, recurrent or residual hematoma, increased intra cranial pressure, wound infection, cerebrospinal fluid leak, meningitis, cerebral abscess, tension pneumocephalus, intra parenchymal hematoma, subdural empyema, speech disturbances, motor deficit, sphincter disturbances and behavioral changes as previously mentioned in the literature and need standard care to prevent and or reduce these complications. Attending training programs about postoperative care standards of patients who had drainage of chronic subdural hematoma is absolutely lacking for nurses working in the Neurosurgery Department to care for such group of patients.

Nurses` knowledge and practice regarding patients who had drainage of chronic subdural hematoma in neurosurgery department of at Assiut University Hospital are inadequate. Application of the developed postoperative care standards for patients who had drainage of chronic subdural hematoma shows a significant improvement in nurses` knowledge and practice. Improving nurses` knowledge and practice have a favorable effect in preventing or reducing postoperative complications.

Recommendations

Based on results of the present study the following can be recommended:

Continued nursing education and inservice training programs at Neurosurgery Department should be organized within Assiut University Hospital and equipped with the necessary educational facilities and materials necessary to upgrade the knowledge and skills of practicing nurses, which will be reflected on better outcome for patients.

Nurses should add to their routine obligations the regular reading of up to date references (periodicals, textbooks, etc.). They should always be encouraged to attend scientific meetings and conferences to keep pace with the rapidly growing wealth of knowledge and practice necessary for proper nursing service.

Nurses should be aware by postoperative complications, how to prevent it and how to deal with it when develop. Nurses should be aware by instructions that given to patients before discharge and inform patients about them.

Patients are to be provided with sufficient written information to remind them with time of treatment with prescribed doses, time of follow up, postoperative complications that may develop and when they must notify physician.

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