

Effect of Educational Program on Nurses' Performance Caring for Patients with Cerebrovascular Stroke

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ABSTRACT

Cerebrovascular stroke (CVS) is the third leading cause of death in the United States of America (USA), and the most common cause of long-term disability in adults. Experts estimate up to 30% of all patients with stroke will deteriorate in the first 24 hours. This statistic supports the need for intensive monitoring by nurses specifically trained in acute stroke care in intensive care unit (ICU). **Aim of this study:** assess the effect of an educational program on nurses' performance regarding caring for patients with cerebrovascular stroke in intensive care unit. **Research Design:** A quazi experimental design was used. **Setting:** This study was conducted in Emergency Medicine ICU, Geriatric ICU and Neurological ICU at Ain Shams University Hospital. **Study Subjects:** A convenient sample of all available nurses (n =37 nurses) were included in this study. **Data collection tools:** self-administered questionnaire sheet and nurses' practice observational checklist. **Results:** the present study revealed that, most of the nurses had got satisfactory level of performance (knowledge & practice) regarding caring of patients with CVS pre the program implementation (8.1% and 10.8% respectively). Meanwhile most of the study sample had got statistically significant improvement in their knowledge and practice regarding caring of patients with CVS post program implementation (89.2% and 78.4% respectively). While this improvement lowered slightly post 3 months at follow up (83.8% and 62.2% respectively). **Conclusion:** inadequacy of the nurses' performance regarding caring of patients with CVS pre the program implementation. Meanwhile most of the study sample had got statistically significant improvement in their performance post the program implementation; while this improvement lowered slightly post 3 months at follow up. **Recommendations:** the importance of establishing booklet guideline for neurointensive nurses caring of patients with CVS based on evidence based practice.

Key words: Brain attack, cerebrovascular accident, Training program & Performance.

INTRODUCTION

The central nervous system (CNS) is considered the master system of the body, it allows humans to interpret, use and act on the input from body senses. It also helps protect and maintain the integrity of normal

functions of the body. Regardless of the cause, dysfunctions in the nervous system can adversely affect the ability to think, reason, predict or carry out simple activity of daily living (Broderick, 2013).

Cerebrovascular stroke (CVS) is a neurological deficit lasting over twenty four

hours that occurs as a result of interrupted arterial blood flow to parts of the brain. With CVS the impairment of oxygen and nutrients to brain cell causes permanent brain damage and impaired function. There are two main types of CVS: ischemic stroke and hemorrhagic stroke. Ischemic strokes are more common than hemorrhagic strokes, they account for 83% of all strokes. Ischemic stroke results from disruption of cerebral blood flow caused by total or partial occlusion by a thrombus or an embolus. Hemorrhagic stroke accounts for 17%, it results from a ruptured blood vessel and hemorrhage into brain tissues. Hemorrhagic stroke has two main subtypes according to the site: intracerebral hemorrhage and subarachnoid hemorrhage (Gocan & Fisher, 2008).

American Association of Neuroscience Nurses (2004) supports the importance of nursing in the care of patients with stroke. Nurses are the caregivers that have the most contact with the patients and have the ability to notice subtle changes quickly. This quick assessment and report to the physician can make a difference in the outcome of the patients. Because "time is brain", nursing professionals must be knowledgeable about stroke care standards to manage these patients quickly and appropriately.

Care of patients with CVS is directed toward minimizing damage resulting from stroke, maintaining adequate cerebral perfusion and decreasing risk of further damage. Nurses play a pivotal role in all phases of care of the patients with stroke. Stroke management has two main phases: acute phase and rehabilitation phase. During the acute phase immediately after patients admission nursing care focuses on monitoring the patients' neurological status, assessing the severity of stroke and preventing complications associated with immobility, hemiparesis, or any neurological deficit produced by stroke (Ellis & Hartley, 2007).

While nurses are best placed to meet the needs of patients and carers in the acute setting (**Department of Health, 2008; Royal College of Nursing, 2008**), evidence suggests they are inadequately prepared to fulfill their role. So educating nurses remains a significant challenge, despite considerable efforts by stroke leaders and educators to support best practice adoption. With increased focus on development and implementation of Stroke Strategy, provincial stroke action plan, gaining a better understanding of what is required to improve stroke education for registered nurses has been identified as a priority (Truran, 2010).

Significance of this study

The CVS is the third leading cause of death in the United States of America (USA) and the most common cause of long-term disability in adults. Over 150,000 people with stroke die each year. There are approximately 5.5 million CVS survivors in the USA and it is estimated that about 13 million individuals have sustained a so-called "silent" stroke. In Egypt the incidence of CVS per year was 1.8% in suburban regions, 2.1% in rural regions, while it recorded only 1.5% in urban population (Emanuel & Cross, 2012) & (Khalifa, 2005).

The estimated number of patients admitted at Ain Shams University Hospitals ICUs (Emergency Medicine ICU, Geriatric ICU & Neurological ICU) during 2012-2013 were 1820 patients; about 350 patients with CVS which constitutes 19% of the total number of patients admitted at ICUs.

As found by the researcher in master thesis study (El sayed, 2012) that all nurses caring for patients with CVS in ICUs at Ain Shams University Hospitals didn't have or receive any training program related to CVS that reflected negatively on their performance (knowledge & practice) whereas most of them had got unsatisfactory level of performance (knowledge & practice) that can increase the patients risk for complications.

So the updated knowledge and using of evidence-based practice are essential to nurses caring of patients with CVS at ICUs. They must be knowledgeable of this initiative to support clinical practice toward improved outcomes of such group of patients. A high quality performance of nurses' caring for patients with CVS at ICUs would decrease morbidity, mortality and improve quality of care for such group of patients. Therefore this study aims to study the effect of an educational program on nurses' performance caring for patients with CVS at ICUs. Hopefully that study results will generate attention and motivation for further studies into this topic to be used as a guide for providing a comprehensive nursing care concerned with such a problem that necessitate the conduction of this study.

Aim of the Study

This study aimed to evaluate the effect of an educational program on nurses' performance regarding caring for patients with cerebrovascular stroke in intensive care units through the following:

1. Assessment of nurses' level of performance (knowledge& practice) regarding caring for patients with cerebrovascular stroke at Intensive Care Units.
2. Developing and implementing educational program for nurses caring for patients with cerebrovascular stroke at Intensive Care Units based on their needs.
3. Evaluating the effect of educational program on nurses' level of performance (knowledge & practice).

Research Hypothesis:

The nurses' level of performance (knowledge & practice) regarding caring for patients with cerebrovascular stroke at Intensive Care Units will be improved after implementation of the educational program.

Subjects and Methods

Research design:

A quazi experimental design was used in this study.

Setting

The study was conducted in (Emergency Medicine ICU, Geriatric ICU and Neurological ICU) at Ain Shams University Hospitals.

Subjects:

A convenient sample of all available nurses (No=37), caring for patients with cerebrovascular stroke in the previously mentioned setting and agreed to participate were recruited in this study.

C) Tools:

Tools for data collection included two tools:

I- Self-administered questionnaire Sheet: (pre&post test)

It was developed by researcher to assess nurses' level of knowledge regarding caring for patients with CVS at ICUs, it was developed by the researcher based on review of relevant recent literature. It was including two parts:

- 1) **The first part:** It concerned with demographic characteristics of the nurses involved in the study such as age, level of education, gender, marital status, years of experience and training courses.
- 2) **The second part:** It included many types of questions (such as MCQ and true or false) to assess the nurse's knowledge regarding the following issues:

- a. Anatomy and physiology of the brain (4 questions) (4grades).
- b. Definition and types of CVS (3 questions) (3grades).
- c. Causes and risk factors of CVS (4 questions) (4grades).
- d. Signs and symptoms of CVS (5 questions) (5grades).
- e. Complications and prognosis of CVS (6 questions) (6grades).
- f. Prevention of CVS (2 questions) (2grades).
- g. Diagnostic investigations of CVS (2 questions) (2grades).
- h. Treatment and precautions of CVS (2 questions) (2grades).
- i. Assessment for patients with CVS (6 questions) (6grades).
- j. Nursing care for patients with CVS (30 questions) (30grades).

Scoring system:

The total score of Knowledge was 64 grades. Each correct answer was given one grade and the incorrect answer was given zero.

It was considered as follows:

- $\geq 80\%$ satisfactory level of knowledge when the total grades were ≥ 51.2 grades.
- $< 80\%$ unsatisfactory level of knowledge when the total grades were < 51.2 grades.

2) Nurses' practice observational checklist: (pre&post test)

This tool adapted from Lynn & Lebon, (2008), Miller & Mink, (2009) and modified by the researcher Elsayed, (2012).

This tool was divided into three parts as the following:

- **The first part:** It was used to assess nurses' practice during primary assessment for patients with CVS at ICUs that included: (airway, breathing & circulation)

- **The second part:** It was used to assess nurses' practice during secondary assessment for patients with CVS at ICUs. It included neurological assessment as follows: (level of consciousness, orientation, motor strength and coordination, pupil's size and reaction, speech & language).

- **The third part:** It was used to assess nursing intervention for patients with CVS at ICUs, It included: (general supportive care, dysphagia assessment and management, care of paralyzed part, care of urinary incontinence, prevention of bed sores, prevention of falling, prevention of deep venous thrombosis, prevention of urinary tract infection, health education for patient and family member, documentation of all nursing care & evaluation of patients' outcomes).

Scoring system:

The total score of practice was 190 grades, each step correctly done was given two grades, while step done incorrectly was given one grade and step not done was given zero.

The total score was distributed as the following:

- Primary assessment (24 grades) that included:

- Airway (6 grades)
- Breathing (10 grades)
- Circulation (8 grades)

-Secondary assessment (52 grades) that included:

- Level of consciousness (6 grades)
- Orientation (6 grades)
- Motor strength and coordination (26 grades)
- Pupil's size and reaction (10 grades)

- Speech & language (4 grades)

- Nursing intervention for patients with CVS (114 grades) that included:

- General supportive care (14 grades)
- Dysphagia assessment and management (22 grades)
- Care of paralyzed part (10 grades)
- Care of urinary incontinence (8 grades)
- Prevention of bed sores (6 grades)
- Prevention of falling (6 grades)
- Prevention of deep venous thrombosis (10 grades)
- Prevention of urinary tract infection (12 grades)
- Health education for patient and family member (8 grades)
- Documentation of nursing care (12 grades)
- Evaluation of patients' outcomes (6 grades)

- It was considered as follows:

- $\geq 80\%$ satisfactory level of practice when the total grade was ≥ 152 grades.
- $< 80\%$ unsatisfactory level of practice when the total grade was < 152 grades.
- **Tools validity and reliability**

Validity was tested through a jury of 7 experts who composed of: 2 professors and 2 assistant professors of medical surgical nursing, 3 lecturers of internal medicine from Ain Shams University. The expertise reviewed the tool for clarity, relevance, comprehensiveness, simplicity and applicability; minor modification was done.

Testing reliability of the proposed tool (self-administered questionnaire Sheet) was done by Cronbach alpha test.

Pilot study:

Before performing the actual study, a pilot study was carried-out on 10% of the study subject in the (Emergency Medicine ICU, Geriatric ICU, and Neurological ICU) at Ain Shams University Hospitals. The pilot study was done to test feasibility and applicability of the tool, used in this study. The nurses who included in the pilot study were excluded from the main study group.

Field Work

Data collections took about 7 months started from February 2014 until August 2014. The field following phases:

1) Preparatory phase:

It was included reviewing of literature related to the program design and the theoretical knowledge of the various aspects of the training program using books, articles, magazines, and internet to develop data collection tools and the training program for nurses.

The preparatory phase took about one month. Requesting the permission for data collection from the Faculty of Nursing/ Ain Shams University to the director of Ain Shams University Hospital at which the study was conducted.

2) Pre program implementation phase

The nurses' practice observational checklist was used prior to administration of the questionnaire sheet to ensure the maximal realistic observations of nurses' practice and minimize the possibility of bias. The tool was done at morning and afternoon shift of after patient admission. It was carried out through a scheduled and specific days arranged for visiting the selected settings (Saturday, Sunday and Monday) for each week.

The nurses' practice observational checklist was filled by the researcher by observing the nurses while caring of patients with CVS at ICUs. It was filled 3 times pre the program implementation; immediately post of the program implementation and post 3 months later (follow up). The time allowed for filling the checklist took about one hour.

The questionnaire sheet was conducted in the clinical area where the nurses were providing the care for patients with CVS at ICUs. The purpose of the study was explained prior to answering the questionnaire. The sheet was filled by nurses' staff in the presence of the researcher to ensure maximum homogeneity response. It was filled 3 times per the program implementation; immediately post of the program implementation and post 3 months later (as follow up). The time allowed for answers took about 35-45 minutes and the answers were recorded by the nurses themselves.

3) Training program implementation phase:

The training program was developed by the researcher based on review of the recent literature **Gulanick & Myers (2014); Ignatavicius & Workman (2013); Potter et al. (2013); Pellico (2013)** and the studied nurses' needs. The content of the educational program was divided into 10 sessions; the time took for each theoretical session about 1 hour and for practical session about 1.30 hour. At the beginning of the first session, an orientation of the training program, its purpose took place and nurses were informed about the time and place of the sessions. The content of the educational program sessions was organized as the following.

The theoretical part:

- Introduction of the training program including objectives of training program and its effect on nurses' performance (knowledge and practice).

- Anatomy and physiology of the brain
- The CVS (introduction, definition, types, causes, risk factors, signs and symptoms, complications, prognosis, prevention, diagnostic investigations, treatment and precautions).
- Nursing assessment for patients with CVS at ICUs including primary and secondary assessment.
- Nursing care for patients with CVS at ICUs.

The practical part:

- 1- Nursing assessment of patients with CVS at ICUs including primary and secondary assessment.
- 2- Nursing care for patients with CVS at ICUs including the following:

- General supportive care.
- Dysphagia assessment and management.
- Caring of paralyzed part.
- Caring of urinary incontinence.
- Prevention of bed sores.
- Prevention of falling.
- Prevention of deep venous thrombosis.
- Prevention of urinary tract infection.
- Health education for patient and family member.
- Documentation of nursing care.
- Evaluation of patients' outcomes.

- After the official permission were taken from the medical disorders, nursing directors and nursing supervisors of the settings under the study, the implementation phase started.

- The program implementation phase took a period of one month. The program was implemented on nurses working at (Emergency Medicine ICU, Geriatric ICU and Neurological ICU) in the term of

sessions with integration of the theory into practice for caring for patients with CVS. The training program includes 10 sessions (5 sessions for theoretical part and 5 sessions for the practical part). The sessions conducted in the morning and afternoon shifts. The morning shift session started from 11 a.m to 1p.m and in the afternoon shift from 3p.m to 6p.m.

- Each session started by the summary about what was given in the previous session and the objectives of the new topics were mentioned, taking into consideration using simple language to suite the level of the nurses. Motivation and reinforcement techniques as praise and recognition during program sessions were used to enhance learning. The handout was distributed to all nurses included in the program in the first day of starting the program implementation.

- Each session included the new topics with general and specific objectives, involving the attractive media and methods. Each session summarized the pervious session, putting into consideration using scientific term to suit the nursing level. The general objective of the program was to update the nurses' knowledge and practice to demonstrate basic clinical skills for caring of patients with CVS at ICUS.

- The group of studied nurses' was about 12 nurses for each shift according to their schedule of working. It was difficult to gather all the nurses at one time, so nurses were divided into two groups, each group about 6 nurses and the program was implemented for each group separately in the same suitable time for each one of them. During classification, all groups were given equal chances to understand the theoretical part and program content, this is to decrease intensity of work stress and their time of ICU allows. To ensure exposure of all nurses to the same learning experience, each group received the same program content and using the same teaching strategies; discussion,

teaching and correction on the spot, real objects, handout, posters and data show. Learning CD was also used to clarify some items during the training.

4) Evaluation phase:

The training program was evaluated by researcher for comparing the change in nurses' knowledge and practice pre, immediately post the program implementation and post 3months later (as follow up) of the program implementation using previously mentioned data collection tools I and II.

Results

Table (1):

Regarding demographic characteristics this table reveals that more than one third of studied nurses (40.5%) were less than 25 years old, while slightly less than one third of them (32.4%) were between 25-30 years old, more than one fourth of them (27.0%) were more than thirty years old with the mean age ($X=27.4 \pm 4.7$) years.

Also, this table reveals that majority of studied nurses (86.5%) were females, while minority of them (13.5%) were males and about half of them (51.4%) were married.

Regarding the nurses' educational level, this table shows that about half of the studied nurses (45.9%) had secondary school nursing diploma and the same percentage had Bachelor degree in Nursing Science, while minority of them (8.1%) had technical nursing education.

Regarding the nurses' years of experience, more than one third of the studied nurses (37.8%) had experience less than 5 years, while slightly less than one third of them (32.4%) had 5-10 years and (29.7%) had more than 10 years and the

mean years of their experience was (8.5 ± 3.6) years.

Concerning attending the training courses, the most of the studied nurses (81.1%) didn't attend any training courses related to nursing care of patients with CVS.

Table (2): Regarding total satisfactory scores of nurses' knowledge regarding caring of patients with CVS, there were highly statistically significant differences between pre/post and post/follow up phases at ($X^2=48.7$ and 42.7 respectively at $p < 0.01$), while there were no statistically significant differences between post/follow up phases at ($X^2 = 0.5$ at $p > 0.05$).

Also this table shows that total satisfactory scores of nurses' practice regarding caring of patients with CVS, there were highly statistically significant differences between pre/post and post/follow up phases at ($X^2=34.2$ and 21.1 respectively at $p < 0.01$), while there were no statistically significant differences between post/follow up phases at ($X^2=2.3$ at $p > 0.05$).

Table (3): This table shows that there is no statistically significant relation between nurses' knowledge and practice regarding caring of patients with CVS at pre test ($X^2=1.7$ at $p > 0.05$).

Meanwhile, there is a highly statistically significant relation between nurses' knowledge and practice regarding caring of patients with CVS at post test ($X^2=7.5$ at $p < 0.01$) and there is statistically significant relation between nurses' knowledge and practice regarding caring of patients with CVS at follow up phase of the program implementation ($X^2=6.3$ at $p < 0.05$).

Table (4): shows that, there is statistically insignificant relation between total nurses' knowledge regarding caring of patients with CVS and their age at pre test, post test and follow up phases of the program

implementation ($X^2=4.8, 2.4$ and 0.4 at $p < 0.05$).

Also, this table reveals that there is no statistically significant relation between nurses' knowledge regarding caring of patients with CVS and their years of experience at pre test ($X^2=1.7$ at $p > 0.05$), meanwhile, there is statistically significant relation between nurses' knowledge and their years of experience at post test and follow up phases of the program implementation ($X^2=7.4$ and 6.7 respectively at $p < 0.05$).

Moreover, this table shows that, there is a highly statistically significant relation between nurses' knowledge regarding caring of patients with CVS and their qualification at pre test and post test ($X^2=15.4$ and 11.8 respectively at $p < 0.01$), meanwhile, there was statistically significant relation between nurses' knowledge and their qualification at follow up phase of the program implementation ($X^2= 6.1$ at $p < 0.05$).

Furthermore, this table shows that there is no statistically significant relation between nurses' knowledge regarding caring of patients with CVS and their social status at pre test and follow up phases of the program implementation ($X^2=5.1$ and 6.3 respectively at $p > 0.05$), meanwhile, there is statistically significant relation between nurses' knowledge and their social status at post test ($X^2=10.7$ at $p < 0.05$).

Table (5): shows that, there is no statistically significant relation between total nurses' practice regarding caring of patients with CVS and their age at pre, post test and follow up phases of the program implementation ($X^2=1.2, 1.9$ and 0.4 at $p > 0.05$).

Also, this table shows that there is no statistically significant relation between nurses' practice regarding caring of patients with CVS and their years of experience at pre test ($X^2=0.3$ at $p > 0.05$), meanwhile, there is a highly statistically significant relation

between total nurses' practice and their years of experience at post test ($\chi^2=10.9$ at $p < 0.01$) and there is statistically significant relation between total nurses' practice and their years of experience at follow up phase of the program implementation ($\chi^2= 6.9$ at $p < 0.05$).

Moreover, this table shows that, there is no statistically significant between nurses' practice regarding caring of patients with CVS and their qualification at pre test ($\chi^2= 5.3$ at $p > 0.05$), meanwhile, there was statistically significant relation nurses'

practice and their qualification at post test and follow up phases of the program of the program implementation ($\chi^2= 7.14$ and 8.5 respectively at $p < 0.05$).

Furthermore, this table shows that there is no statistically significant relation between nurses' practice regarding caring of patients with CVS and their job at pre and follow up of the program implementation ($\chi^2=0.9$ and 2.6 respectively at $p > 0.05$), meanwhile, there is a highly statistically significant relation between total nurses' practice and their job at post test ($\chi^2=7.5$ HS at $p < 0.01$).

Table (1): Number and percentage distribution of the demographic characteristic of the nurses under study (no=37).

Item	N0	%
Age		
<25	15	40.5%
25 – 30	12	32.4%
30+	10	27.0%
Mean	27.4	
SD	± 4.7	
Gender		
Male	5	13.5%
Female	32	86.5%
Marital Status		
Single	14	37.8%
Married	19	51.4%
Widowed	1	2.7%
Divorced	3	8.1%
Years of Experience in ICU		
<5 years	14	37.8%
5 – 10	12	32.4%
>10 years	11	29.7%
Mean	8.5	
SD	± 3.6	
Place of Work		
Geriatric ICU	9	24.3%
Emergency medicine ICU	10	27.0%
Neuro ICU	18	48.6%
Job		
Nurse – head	4	10.8%
Nurse	33	89.2%
Academic Qualifications		
Secondary school nursing diploma	17	45.9%
Technical institute	3	8.1%
University degree in Nursing	17	45.9%
Training courses		
Yes	7	18.9%
No	30	81.1%

*P< 0.05 Significant, **P< 0.01 High Significant, P>0.05 Insignificant & Satisfactory level 80%

Table (2): Percentage distribution of the total satisfactory scores of nurses’ knowledge and practice regarding caring of patients with CVS at pre, post and follow up phases (no=37).

Items	Pre (no=37) satisfactory %	Post (no=37) satisfactory %	Follow up (no=37) satisfactory %	X ² test					
				Pre/post		Pre/Follow up		post/Follow up	
				X2	P	X2	P	X2	P
Total knowledge	8.1%	89.2%	83.8%	48.7	< 0.01**	42.7	< 0.01**	0.5	> 0.05
Total practice	10.8%	78.4%	62.2%	34.2	< 0.01**	21.1	< 0.01**	2.3	> 0.05

P< 0.05 Significant, **P< 0.01 High Significant, P>0.05 Insignificant & Satisfactory level 80%

Table (3): Relation between total satisfactory scores of nurses' knowledge and practice regarding caring of patients with CVS (no=37)

Practice	Knowledge				X2 test	
	Satisfactory		Unsatisfactory		X2	P
	No	%	No	%		
Pre						
Satisfactory	1	2.7%	3	8.1%	1.7	> 0.05
Unsatisfactory	2	5.4%	31	83.8%		
Post						
Satisfactory	28	75.7%	1	2.7%	7.5	< 0.01**
Unsatisfactory	5	13.5%	3	8.1%		
Follow-up						
Satisfactory	22	59.5%	1	2.7%	6.3	< 0.05*
Unsatisfactory	9	24.3%	5	13.5%		

P< 0.05 Significant, **P< 0.01 High Significant, P>0.05 Insignificant & Satisfactory level 80%

Table (4): Relation between total satisfactory scores of nurses' knowledge regarding caring of patients with CVS and their demographic characteristics (no=37).

Items	Total knowledge (pre)			Total knowledge (post)			Total knowledge (follow up)		
	Satisfactory		X ² test & Sig	Satisfactory		X ² test & Sig	Satisfactory		X ² test & Sig
	No	%		No	%		No	%	
Age									
20 -25	3	8.1%	4.8 NS	13	35.1%	2.4 NS	12	32.4%	0.4 NS
25 - 30	0	0.0%		12	32.4%		10	27.0%	
30+	0	0.0%		8	21.6%		9	24.3%	
Gender									
Male	1	2.7%	1.1 NS	5	13.5%	0.7 NS	5	13.5%	1.1 NS
Female	2	5.4%		28	75.7%		26	70.3%	
Social Status									
Single	2	5.4%	5.1 NS	13	35.1%	10.7 S	12	32.4%	6.3 NS
Married	0	0.0%		18	48.6%		17	45.9%	
Widow	0	0.0%		0	0.0%		1	2.7%	
Other	1	2.7%		2	5.4%		1	2.7%	
Experience									
<5 years	2	5.4%	1.7 NS	10	27.0%	7.4 S	9	24.3%	6.7 S
5 - 10	1	2.7%		12	32.4%		12	32.4%	
>10 years	0	0.0%		11	29.7%		10	27.0%	
Work place									
Geriatric ICU	1	2.7%	0.3 NS	8	21.6%	0.1 NS	8	21.6%	0.9 NS
Emergency medicine ICU	1	2.7%		9	24.3%		9	24.3%	
Neuro ICU	1	2.7%		16	43.2%		14	37.8%	
Job									
Head nurse	0	0.0%	0.4 NS	3	8.1%	0.9 NS	3	8.1%	0.3 NS
Nurse	3	8.1%		30	81.1%		28	75.7%	
Education									
Diplom	1	2.7%	15.4 HS	15	40.5%	11.8 HS	15	40.5%	6.1 S
Institute	2	5.4%		1	2.7%		1	2.7%	
Bach	0	0.0%		17	45.9%		15	40.5%	
Training									
No	3	8.1%	0.8 NS	26	70.3%	1.1 NS	26	70.3%	0.9 NS
Yes	0	0.0%		7	18.9%		5	13.5%	

P< 0.05 Significant, **P< 0.01 High Significant, P>0.05 Insignificant & Satisfactory level 80%

Table (5): Relation between total satisfactory scores of nurses’ practice regarding caring of patients with CVS and their demographic characteristics (no=37).

Items	Total practice (pre)			Total practice (post)			Total practice (follow up)		
	Satisfactory		X ² test & Sig	Satisfactory		X ² test & Sig	Satisfactory		X ² test & Sig
	No	%		No	%		No	%	
Age									
20 -25	1	2.7%	1.2 NS	11	29.7%	1.9 NS	9	24.3%	0.4 NS
25 – 30	1	2.7%		11	29.7%		7	18.9%	
30+	2	5.4%		7	18.9%		7	18.9%	
Gender									
Male	0	0.0%	0.7 NS	4	10.8%	0.01 NS	4	10.8%	0.8 NS
Female	4	10.8%		25	67.6%		19	51.4%	
Social Status									
Single	1	2.7%	1.2 NS	12	32.4%	4.3 NS	10	27.0%	2.3 NS
Married	3	8.1%		15	40.5%		11	29.7%	
Widow	0	0.0%		0	0.0%		1	2.7%	
Other	0	0.0%		2	5.4%		1	2.7%	
Experience									
<5 years	2	5.4%	0.3 NS	7	18.9%	10.9 HS	6	16.2%	6.9 S
5 – 10	1	2.7%		11	29.7%		11	29.7%	
>10 years	1	2.7%		11	29.7%		6	16.2%	
Work place									
Geriatric ICU	2	5.4%	1.7 NS	7	18.9%	0.7 NS	6	16.2%	2.6 NS
Emergency medicine ICU	1	2.7%		7	18.9%		8	21.6%	
Neuro ICU	1	2.7%		15	40.5%		9	24.3%	
Job									
Head nurse	1	2.7%	0.9 NS	1	2.7%	7.5 HS	1	2.7%	2.6 NS
Nurse	3	8.1%		28	75.7%		22	59.5%	
Education									
Diplom	0	0.0%	5.3 NS	10	27.0%	7.14 S	14	37.8%	8.5 S
Institute	0	0.0%		3	8.1%		0	0.0%	
Bach	4	10.8%		16	43.2%		9	24.3%	
Training									
No	3	8.1%	0.1 NS	24	64.9%	0.2 NS	20	54.1%	1.4 NS
Yes	1	2.7%		5	13.5%		3	8.1%	

*P< 0.05 Significant, **P< 0.01 High Significant, P>0.05 Insignificant & Satisfactory level 80%

Discussion

Cerebrovascular stroke have a leading cause of disability worldwide. Nurses frequently are the professionals who see the full impact of CVS and have the skills that can alter the course of patient's recovery, it is important for nurses to have a valuable resource to help them achieve the best possible outcomes (Thompson et al., 2009).

Related to gender, the present results showed that the majority of the nurses under

study were females. This might be due to nursing education for male begins recently. This finding is consistent with Maarouf (2012), El-Sayed (2009) & Taha (2007) who found that the majority of the nurses were female.

As Regards nurses' age, the present study shows that, more than two third of the nurses their age were less than twenty five years and the minority of the nurses their age were more than thirty years, while more than one third of them had less than five years of

experience. This might be due to most of those nurses were newly graduate and young.

This finding goes in the same line with, **Maarouf (2012), El-Sayed (2009), & Taha, (2007)**, who found that most of nurses caring of patients with CVS were newly graduated and have few years of experience. This finding also was in agreement with **Michael, (2006)** who found that, more than half of nurses' ages were less than 30 years old and female, which might explain that they are young and tolerate the nature of ICU atmosphere of work.

In relation to nurses' educational level, the present study found that about half of the nurses had secondary school nursing diploma and about half of the nurses had bachelor degree in nursing since. This might elaborate the current condition of nursing qualification. This is due to the high demand by the Egyptians to increase the number of nurses with bachelor degree in ICU.

These findings were in the same line with **Maarouf (2012) & Taha, (2007)** which showed that more than half of the study nurses were nursing diploma. This result is confirmed with **Morad ,(2010) & El Sayed (2009)**, who found that all the nurses under the study had secondary school nursing diploma.

This result is inconsistent with **Wilson (2007)** who found more than half of the nurses had got diploma with specialty degree & the minorities of them had got Bachelal Science Nuring (B.S.N) degree and added that the (B.S.N) nurses had a more comprehensive knowledge and practice base than the nurses with diploma.

This study finding is contradicted with **Watts, Gibbons & Kurzweil (2011)**, who reported that, the nurses in critical care unit have a need to improve their educational level. This finding also is not supported by **Fernandez, (2014)** who stated that the role

of the nurse as a case manager is multifaceted, coordinators, facilitator and educator. It requires an expert knowledge CVS care and the consequence on the human body. Besides that, patients with CVS had a right to be cared by specialized trained and educated nurses.

The present study finding showed that, majority of the nurses didn't receive training course about the caring for patients with CVS in ICU. This could be attributed to lacking of interest of hospital administration about conducting training programs especially in critical care units. The training courses implementation for nurses about caring for patients with CVS in ICU is very important to improve their performance that affect positively on quality of care for such group of patients.

This study result is consistent with **El-Sayed, (2012)** who found that the majority of the study nurses didn't attend any training courses related to CVS. Also, the result is confirmed by **Taha, (2007)** who states that the majority of total sample didn't attende any training courses related to patients with CVS.

The study result also was consistent with **Dexter, Cosgrove & Douglas (2007)** who reported that, it is important that nurses receive appropriate training in the management of patients with CVS and ensure that patients are cared safely and competently.

This study result is contradicted with **Guilbert, (2000)** when identified that, the effective professional education requires close and more appropriate connection between theory and practice. Similarly with **Paul,(2010)** who highlighted that, the optimal care of the patient with CVS requires an enormous amount of effort which begins with planning and preparation of system development in which personnel are educated and trained.

Regarding total nurses' knowledge and practice related to caring of patients with CVS. The study results revealed that there were unsatisfactory scores pre the educational training program implementation with improvement post its implementation, while this improvement lowered slightly at follow up phase. This might be due to improved level of nurses' knowledge and practice after application of training program.

On the other hand, there were highly statistically significant differences between pre/post and pre/follow up phases regarding total nurses' knowledge and practice related to caring of patients with CVS, while there were no statistically significant differences between post/follow up phases. This might be due to lack of continuous supervision.

This is in the same line of **El-Sayed, (2012)** which revealed that all the study nurses had unsatisfactory level of total practice regarding caring for patients with CVS in ICU. This was in the same line with **Aly, (2010)** who found that nurses' practice regarding caring of patient with CVS was unsatisfactory.

On the same line **Carter et al. (2009) & Edward (2006)** supported that, educational programs for nurses on stroke units meet the needs of their role regarding facing many challenges in the workplace, impact on their practice and influence patient outcomes. Also **Maarouf ,(2012)** who stated that, the most of study subjects had diploma degree.

From the researcher point of view emphasized on continuing education for each member of stroke team about, stroke and stroke management to provide the best care as determined by evidence based practice. In addition, nursing staff spend the most time with the patient and must develop excellent assessment, monitoring and clinical reasoning skills to provide competent care and work collaboratively with the physician and other team members.

This is in the same line of **El-Sayed,(2012)** which revealed that two third of the study nurses had unsatisfactory level of total knowledge regarding caring for patients with CVS in ICU. In this behave, **Aly,(2010)** found that, nurses' knowledge about stroke care, more than were below average grade in half of nurses.

This study finding is similar to study done by **Morad,(2010)** who found that, total nurses' practice regarding nursing management of patients with CVS in the ED was satisfactory and with **Taha,(2007)** who stated that, there is a highly statistically significant difference among nurses under study in emergency unit regarding their total knowledge and practice toward caring of patients with CVS.

The present study is in agreement with **El sayed, (2009)** who showed that there were significance differences between nurses' knowledge and practice pre, post, and post six months of program implementation. The majority of the subjects were developing their knowledge after refreshment of training.

According to **Ryan, (2009)** who stated that, the goals of treatment include management of life threatening conditions with orientation to protect the brain from further neurologic injury.

Relation between nurses' knowledge and practice in relation to their age, years of experience, their qualifications, job and social status.

Regarding relations between total nurses' knowledge and practice with their experience, the study showed that, there were no statistically significant relation at pre the educational training program implementation, while there were statistically significant relation between post and follow up phases. This might be due to the nurses who got satisfactory performance had experience more than 5 years.

This finding is in agreement with **Maarouf, (2012)** who revealed that there was statistically significant relation between nurses' practice and years of experience. **Taha, (2007)**, who stated that there was a statistically significant correlation between nurses' years of experience and their level of knowledge. The practical knowledge as mentioned by **Wieck, (2006)** is the knowledge of how to perform in the professional situation. The nurse learns knowledge through her practice and experience, and teaches them most about the care that they should offer.

This result is in agreement with result of **El-Sayed, (2012) & Elsayed, (2009)**, which revealed that there was no statistically significant relation between nurses' performance (knowledge & practice) and nurses' years of experience. This result was supported by **DeLucia, Ott, & Palmieri (2009)**, who found that work experience influences nurses' performance.

This finding is supported by **Delucia et al. (2009)** who found that, work experience influences nurses' performance. This result is in agreement with **Sauaia et al. (2007)**, who stated that, when the years of experience are increased; nurses have to learn more to improve their knowledge, and skills for patient care. From the researcher point of view the years of experience are very important for nurses and other practitioners to increase their knowledge, confidence and skills.

Nursing knowledge and experience should continuously inform the nurse's decision making process. The extent of clinical decision-making should be appropriate to the level of practice. The educational preparation and clinical skill should match the level of that practice **Keenan, (2002)**. In this context **Elsayed, (2001)** mentioned that the nurses knowledge increases with increasing their years of experience and this could be attributed to that

the majority of them, acquired their knowledge from easily resources such as from the practical field.

Moreover this study finding showed that, there were no statistically significant relation between total nurses' knowledge and their qualification pre the educational training program implementation, while there were statistically significant relation at post and follow up phases. This might be due to the education has a vital role in improving the knowledge and practice of the nurses and consequently improving the quality of care rendered to patients with CVS.

This result is not in agreement with result of **El-Sayed, (2012)** which revealed that there was no statistically significant relation between nurses' performance (knowledge & practice) and nurses educational level. Also **Al-Ahmadi, (2009)** showed that level of education is negatively correlated with job performance, indicating that the higher the level of education, the lower job performance of nurses this results may be due to that the most of registered nurses occupied administrative work more than case management.

Also this result is not in agreement with **Maarouf, (2012) & Taha, (2007)** who showed that, there was no statistically significant relation between nurses' Knowledge and nurses' educational level.

Similarly **Guilbert, (2000)** mentioned that, the effective professional education requires close and more appropriate connection between theory and practice that have a great impact on their knowledge, and skills for patients care. From the researcher view nurse's action is based on professional inferences, as their ability to make nursing diagnosis and to prescribe nursing action are based on the development of nursing science. The professional practitioner nurses must continue to learn to meet their responsibilities.

Additionally, this study finding revealed that there were no statistically significant relation between total nurses' practice for caring of patients with CVS and their qualification, while there were statistically significant relation post the educational training program implementation and follow up phases. This might be due to the nurses who got satisfactory performance had higher education (bachelor degree in nursing) and this indicates the importance of qualification for integrating theory into practice and improving quality of care rendered for such group of patients.

This result is not in agreement with **Maarouf, (2012) & Taha, (2007)** who showed that, there was no statistically significant relation between nurses' practice and nurses' educational level. This study finding is contradicted with **Al-Ahmadi, (2009)** who showed that, level of education is negatively correlated with job performance, indicating that the higher the level of education, the lower job performance of nurses this results may be due to the most of registered nurses occupied administrative work more than case management.

Study result showed that, there was no statistically significance relation between total nurses' knowledge and practice for caring of patients with CVS and their age pre, post the educational training program implementation and follow up phases. This might be due to the fact that, senior nurses, of a higher age category take administrative role, so they are far away from the practical field and consequently their mastering skills are decreased or diminished.

This result is in agreement with result of **El-Sayed, (2012)** which revealed that there was no statistically significance relation between nurses' performance (knowledge & practice) and nurses' age. This result is in accordance with **Elsayed, (2009) & Taha, (2007)** who found, that there was statistically insignificant relation between nurses' performance (knowledge and practice) and

their age. This is contradicted with **Maarouf, (2012)** who revealed that there was highly statistically significance relation between nurses' practice and nurses' age.

Moreover this study finding showed that, there were no statistically significant relation between nurses' knowledge and their social status at pre the educational training program implementation and follow up phases, while there were statistically significant relation at post its implementation phase. This may be due to marital stability and satisfaction, the work load, facilities available

This result is in agreement with result of **El-Sayed, (2012)** which revealed that there was a statistically significant relation between total nurses' knowledge and their marital status. This result is not in agreement with **El-Metwally, (2012)** who found that there was no statistically significant relation between nurses' knowledge and their social status.

Moreover, this study finding showed that, there were no statistically significant relation between total nurses' practice and their job pre the educational training program implementation and follow up phases, while there were highly statistically significant relation at post its implementation phase regarding staff nurse. This may be due to that the staff nurses gives people more attention and have more contact with their patients and relatives.

This result is in the same line with **Ahmed, (2013)** who found that there was highly statistically significant positive relation between total level of practice and pre/ post, pre/after 6 months of program implementation regarding staff nurse. This result is not in agreement with **El-Metwally, (2012)** who found that there was no statistically significant relation between nurses' practice and their job.

Relation between total nurses' knowledge and their practice:

The current study showed that, there were no statistically significant relation between total nurses' knowledge and their practice pre the educational training program implementation, while there were statistically significant relation post its implementation and follow up phase. This might be due to the training program improved level of nurses' knowledge which affecting positively on their practice regarding caring of patients with CVS.

This result is not in agreement with result of **El-Sayed, (2012)** which revealed that there was insignificant correlation. Whereas, nurses who got satisfactory knowledge had unsatisfactory performance. This result is in the same line with **Aly, (2010)** who revealed that there was a correlation between nurses' knowledge and performance. Also **Griffiths, Murrells & Maben, (2010)** and **Thiangchanya, Taboonpong & Rattanalert (2008)** results indicated that there was association between nursing staffing level and quality of the clinical care.

This result is in agreement with **Ali, (2003)** who found a significant correlation between knowledge and practice. In this study carried out by **Gulanick, Klopp & Galames (2002)**, they reported that the technical skills cannot be separated from intellectual and interpersonal skills. Intellectual skills related to technical skills include the nurses' knowledge of the principles and steps of the procedures, **Cook, etal. (2013)**, study findings demonstrate that educational intervention effectively increased nurses' knowledge and confidence in applying content into practice.

This result is not in accordance with **Maarouf, (2012)** who revealed that, there was no correlation between nurses' knowledge and nurses' practice regarding

nursing management of patients with CVS. **El-sayed, (2001)** who reveals that, the nurses under study had no statistically significant correlation between their knowledge and practice. This could be attributed to the lack of preparation prior to work in ICU and training concerning patients with CVS and their nursing care, shortage of staff, lack of facilities, and unavailability of guideline-books and lack of interest among nurses working at ICU. This finding was congruent with **American Association of Neuroscience Nurses, (2004)** which found statistically significant positive correlation between knowledge and practice of nurses.

This study is not supported by **Michael & Romer (2008)**, who mentioned that, the quality of nursing care is influenced by the knowledge, judgment, skills and values of those participating in the care of patients and the nurses' cognitive ability to decide on a plan of action that depends upon their education.

According to **Wieck, (2006)** who stated that, patients with CVS can be a source of anxiety for nurses. However, with a good knowledge base to initiate the assessment, planning and implementation of quality care, nursing these patients can prove highly rewarding, and the skills acquired can promote confidence in the care of all patients. **Newmarch, (2006)** who reported that, the educational program has a positive effect on the nurses' knowledge and performance and improve the quality of the nursing care given to the patient.

In summary, the results of this study revealed that, there is a need to focus on development of nursing staff knowledge and skills, so effort should be directed toward enhancing creativity among nurses. Nurses must have access to updated information, learning resources, and continuous educational opportunities.

Finally, provision of high quality and competent care for patients with CVS is the elusive goal of any health care institution. The nurses' work in CVS unit must constantly seek better ways to improve the quality of care rendered for such group of patients through acquiring knowledge and through implementing the established standards of care which must be up dated periodically.

Conclusion

Based on the findings of this study, the following can be concluded:

- Inadequacy of the nurses' performance (knowledge and practice) regarding caring for patients with CVS pre the program implementation. Meanwhile, most of the study sample had got statistically significant improvement in their performance post the program implementation, while this improvement lowered slightly post 3 months at follow up, which justify the study hypothesis.

Recommendations

Based on the study results, the following are recommendations can be deduced:

- 1- The importance of implementing booklet guideline for nurses caring of patients with CVS. This booklet established a standard for ensuring that patients with CVS are managed according to the type and severity of CVS, which includes fundamental procedures related to patients with CVS such as primary assessment, secondary assessment, and nursing intervention for caring of such group of patients.
- 2- Supervisors and head nurses caring for patients with CVS at ICU should attend continuous refreshing educational

training programs to be acquainted with up-to-date knowledge to reach and guide their staff, and to be a role model for them.

Further studies

- 3- Implementing the educational training program on a wider field including all governmental hospitals is necessary to raise the efficiency of nursing care given for patients with CVS.
- 4- Determine the impact of the educational training program for caring of patients with CVS on quality of life for such group of patients.

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