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**Effect of an Educational Program on Nurses' Practice Regarding Care of Patients  
with Cerebral Stroke**

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**ABSTRACT**

**Background:** The terms "stroke" and "nontraumatic cerebral hemorrhage" are used interchangeably. The ratio of infarct to bleeding varies by demographic (race, age, comorbidities), but it is roughly 4 to 1. A variety of disease mechanisms can cause a cerebral infarction, but they all result in obstruction of cerebral arteries or veins. **Aim of the study:** Explore effect of an educational program on nurses' practice regarding care of patients with cerebral stroke. **Subjects and method: Design:** A quasi-experimental design was utilized to conduct the study in the intensive care unit at Port Said general hospitals. **Setting:** The study was conducted in the intensive care unit at Port Said General Hospital. **Subjects:** convenient sample (50) nurse. **Tools:** Nurses' observational checklist. **The Results:** (20%) of studied nurses had satisfactory total practice preprogram compared to (96%) immediately after post-program implementation and (92%) of them followed up 3 months after program implementation. **Conclusion:** Statistically significant differences in nurse practice before, immediately, and after program implementation. **Recommendations:** Provides a continuous training program for nurses in the care of stroke patients, as well as hands-on training in low-practice areas to provide the highest level of care for nurses.

**Keywords:** educational program, Nurses' Practice, Observational Checklist, Stroke

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## INTRODUCTION

Cerebral Circulation: The brain does not store nutrients, has high metabolic demands, and necessitates a large amount of blood flow. Approximately 15% of the cardiac output, or 750 ml per minute, is delivered to the cerebral circulation. The blood routes in the brain are distinctive in various respects. First, unlike other organs in the body, arterial and venous blood vessels do not run in parallel; this is partly due to the venous system's role in the absorption of cerebrospinal fluid. Second, the circle of Willis provides collateral circulation to the brain, allowing blood flow to be altered as necessary. Third, brain blood arteries contain two layers rather than three, making them more likely to rupture when weakened or pressured (Proulx, S.T. 2021).

When patients present within a specified time window of symptom onset, the concept of "time is brain" has become the major premise for guiding rapid clinical diagnosis and acute therapeutic selection. ( Honan & Esposito, 2018) A stroke is a disease in which normal blood flow to a portion of the brain is interrupted, depriving it of nutrition and oxygen. As a result, the damaged area's brain cells die in a short amount of time ( Patnaik et al. 2019).

Stroke is one of the most frequent disorders, affecting one out of every four people at some point in their lives. The majority of strokes are caused by a reduction in or interruption of blood flow to the brain (ischemic stroke). A number of these could be caused by a moderate or severe case of cerebral vein thrombosis. Bleeding is responsible for 20-30% of strokes, which is caused by damage to small and medium blood vessels. A stroke is a life-threatening medical condition that causes a localized neurological impairment. Prompt examination, diagnosis, and therapy to restore blood flow can help to alleviate symptoms and prevent brain injury (H Barker,2021).

The study discovered that stroke rates and outcomes differed depending on gender, race, and geographic region. Women are more likely to develop AIS throughout their lives and have worse results. Stroke rates were higher in black men, and the disparity was even greater among younger patients (Samaniego & Hassan, 2019). (Hickman & Fitzpatrick, 2018)

A stroke is a highly complex process that may be separated into two stages: a relatively simple early "plumbing" issue caused by a disturbance in blood flow and energy supply to the brain, and a more complex secondary cascade issue. On the one

hand, it is influenced by the interaction of metabolism and dysfunction, as well as the interaction of hemodynamic and molecular alterations. When a blood clot or embolus blocks blood flow to any portion of the brain, the brain tissue begins to lose oxygen and matrix (Brain & Hayes, 2019).

**An ischemic stroke** is caused by a clogged blood vessel. This is ischemia (92 percent), which is a blockage of the arteries delivering blood to the brain. Cerebral or carotid arteries, or cerebral veins, are the most possible ones (Csiba & Baracchini,2016).

**Hemorrhagic strokes** are caused by blood artery rupture and blood flow into the brain (about 10 percent ). Aneurysms and arteriovenous malformations are two types of compromised blood vessels that can cause a hemorrhagic stroke. Uncontrolled high blood pressure, on the other hand, is the most common cause of hemorrhagic stroke (sustained hypertension). When blood penetrates the brain tissue (parenchyma), the ventricles, or the subarachnoid space, it is called a hemorrhagic stroke. Normal brain metabolism is interrupted when blood forms a mass outside the vasculature that compresses nearby brain tissue, resulting in increased intracranial pressure (ICP), secondary bleeding, and additional ischemia ( Patnaik et al.,2019).

Symptoms of any sort of stroke include: The American Heart Association and the American Stroke Association have identified five signs or symptoms that demand immediate EMS response: Numbness or weakness of the face, arms, or legs, especially on one side of the body, disorientation, or difficulty speaking or understanding Difficulty One or both eyes experience a sudden vision change. Walking becomes very difficult suddenly. Dizziness, dizziness, dizziness, dizziness, dizziness, dizziness, sudden intense headache discomfort with no apparent cause (Denny et al., 2019).

Vital signs (lung function, heart rate, blood pressure), neurological symptoms, the severity of neurological deficit based on validated stroke scales, time to symptom onset, and potential applicability for specific treatments should all be considered during the initial clinical evaluation of patients with severe stroke (Mendelow et al., 2015; Urden et al., 2019).

The National Institutes of Health (NIHSS) Stroke Scale has become a widely used measure for determining the severity of a stroke and analyzing patient outcomes after therapy. The NIHSS is a 42-point rating scale, with 0 indicating no neurological impairment and 42 signifying the worst possible result. It examines six primary areas of neurological function: (1) locomotor control, (2) visual function, (3) motor function, (4)

sensory and neglect (ignoring impulses on one side of the body), (5) cerebellum function, and (6) language and. The National Institute of Health Stroke Scale (NIHSS) was developed by stroke teams and is now used by caregivers to track neurological deficits in stroke patients and to record stroke severity. (Urden et al. 2019, Urden et al., Urden et al., Urden

Maintain a care plan to keep care of a thorough neurological examination. Assessment of mental status (orientation, mood, cognition, memory, attention, speech, and language), motor control, swallowing ability, hydration status, fluid output, skin integrity, and activity levels should all be part of a systematic strategy for analyzing and documenting findings. Ongoing nurse assessments continue to focus on changes in cognition and functional impairment, guiding nursing diagnoses as needed (Honan & Esposito, 2018).

Nurses play a crucial role in the care of patients who have had a cerebrovascular accident (CVA). When caring for stroke victims, nurses must possess certain competencies and practical skills. Nurses must collaborate well with members of diverse teams both within and outside of institutions (Buijck & Ribbers, 2018; Tulek, et al., 2018). Nurse supervision: One of the most difficult tasks for intensive care nurses in assessing and caring for patients with neurological disorders. Neurological assessments of the depth and complexity observed in other body systems may not be included in basic nursing education or critical care training (book, 2016)

In the acute phase after a stroke, nursing interventions aim to prevent secondary brain injury (intracranial hypertension), protect the airway (due to pharyngeal muscle paralysis), provide systemic support (vital signs, fluid, and electrolyte balance), and avoid complications (atelectasis and pneumonia). A general assessment of the patient's condition should be performed upon admission to the emergency department (A&E), determining their baseline neurological status and appropriate positioning, while the level of consciousness should be determined quickly, as it is one of the most sensitive indicators of neurological status. Advanced care should involve the routine practice of a variety of particular nursing treatments, including continence management, stress zone care, swallowing management, and early mobilization, to aid patient recovery (Theofanidis & Gibbon, 2016).

### **Significance of the study**

The burden of stroke and the high prevalence of its risk factors in Egypt are alarming, a lot of studies internationally showed that there are a lot of irreversible complications

occurred due to bad nursing intervention for critically ill patients with cerebral stroke, and the situation is made worse as the national data on stroke statistics are very limited. Moreover in Egypt, found that most hospitalized patients with cerebral stroke have many complications due to a lack of nurses' practice (Asal 2014).

**This Study aims to:**

Evaluate effect of an educational program on nurses' practice regarding care of patients with cerebral stroke. This aim will be achieved through the following objective:

**Research objectives:**

1. Assess nurses' practice regarding cerebral stroke.
2. Develop an educational program regarding cerebral stroke.
3. Implement the educational program regarding cerebral stroke.
4. Evaluate the educational program immediately after implementation and a follow-up will be carried out after 3months.

**Research Hypothesis:**

To achieve the research objectives, the following research hypotheses were formulated:  
Enrollment in a stroke nursing training program will improve nurses' practice of caring for stroke patients

**SUBJECT AND METHOD****Research Design:-**

The design of this study is a quasi-experimental design done to evaluate the impact of educational program on nurses' practice related to the care of patients with cerebral stroke.

**Setting:-**The research was carried out in the Intensive Care Unit of Port Said General Hospital (El Zohor Hospital): the medical unit on the third floor has two rooms (8 beds for men and 6 beds for women), and the ICU on the first floor has two rooms with four beds each, Port Fouad General Hospital: Medical Units (male and female rooms on the scored floor and ICU on the scored floor, and Port Said General Hospital: ICU and medical units on the scored floor

**Subjects:-**A convenient sample was used with available nurses in mentioned units (50 nurses).

**Tools of data collection:**

**Tool I:** Nurses' practice observational checklist.

It has been adapted (Asal, 2014) for nurses' practice in the care of stroke patients. It contains a set of items (17 statements or questions) related to maintaining the patient's airway, correct positioning, assessing the state of consciousness, checking vital signs, and documenting admission and delivery.

**Part (1):** It includes information about the nurses studied, such as their name, age, and gender, as well as information about their jobs, such as years of experience and involvement in training programs.

**Part (2):** It includes 17 statements or questions about managing the patient's airway, proper placement, assessing the patient's level of awareness, checking vital signs, and documenting admission and delivery.

**Scoring system:**

For nurse practice, give 1 for every correct answer and 0 for every wrong answer. The total scores for responding nurses were added and converted to percentages. The total amount for the Nurse Internship is calculated as follows: - All values  $\leq 75\%$  are considered unsatisfactory - although values  $>75\%$  are considered satisfactory.

**Statistical analysis of data:**

Collected data were organized, tabulated, and statistically analyzed using the Statistical Package for Social Sciences (SPSS) version 16 for Windows running on an IBM-compatible computer. Qualitative data (categorical data) were expressed as relative frequency (number) and percentage distribution, and chi-square ( $X^2$ ) or Mann-Whitney test ( $Z$ ) was calculated for comparison between groups. Quantitative data were expressed as mean  $\pm$  standard error, and Student's ( $t$ ) test was calculated to compare the two means. For interpretation of results,  $p$ -values  $\leq 0.001$  were considered significant.

**Operational design**

The operational design includes the preparatory phase, content validity, pilot study, and fieldwork.

### A-Preparatory phase

It includes a review of nursing textbooks, as well as research on individual aspects of the subject using books, papers, the Internet, and journals and periodicals (e.g. pub med, Cochrane databases, MEDLINE)

### B-Content validity

The tools were evaluated for clarity, relevance, completeness, understandability, and applicability by 11 expert reports from academic medical and surgical nurses and medical paramedics who directly treat stroke patients.

### -Reliability:

It evaluates the tool's internal consistency using the Alpha Cronbach coefficient, which in practice is (0.834).

### C-Pilot study

To verify the tool's clarity, objectivity, and feasibility, a pilot study will be done on a 10% sample. It is carried out before data collection to determine appropriateness.

### D-Field work

the study was conducted through three phases:

- 1- Preparatory phase
- 2- Implementation phase
- 3- Evaluation phase

### **Phase I: preparation phase**

A- A training plan was established to analyze the outcomes of the Nurse Practice Assessment concerning the care of stroke patients, as well as the requirements identified during the assessment phase, (Asal, 2014). To help with data collecting, the researchers generated the following documents at this point.

### **B- Program objectives:**

- Improve nurses' practice related to the care of patients with cerebral stroke.

### **B-Planning of action:**

- The researchers applied all the steps in front of the participants and discussed the rationale and caveats for each step.

- At the end of the research, the nurse asks if the ambiguous steps need to be repeated or checked before demonstrating again.

### **C-Permission for conducting the study**

The head nurse of the Medical Intensive Care Unit at Port Said General Hospital took over the study after describing the goal, date, and location (El-Zohor Hospital, Port Foad General Hospital, and El-Salam Hospital).

### **Phase II: Implementation phase**

- At the beginning studied nurses were divided into 5 groups (10 nurses )
- During this meeting the researcher:
  - a- Explain the purpose of the study
  - b- Give each nurse handout including procedure steps to facilitate remembering practical steps about the care of patients with cerebral stroke.
- Using various teaching approaches such as demonstrations and repetitions, provide procedures clearly and concisely. - Go over the reasons and considerations for each step with them. - Nurses were asked at the end of the session whether any points needed to be reiterated or explained before they could demonstrate again.

### **Phase III: Evaluation phase**

- Each nurse was evaluated two times for practice using the observational checklist tool

### **Ethical consideration:**

Permission to conduct the research was obtained from the competent authorities in the research environment after describing the aim. Explain the study's purpose to each participant so that they understand the significance of their involvement. Patients will be given a brief explanation of the study to ensure that the information received will be kept confidential and used solely for research reasons. The data collection technique does not detract from the work's overall harmony. Nurses will be notified of their ability to withdraw from the study at any time, and all data obtained from study subjects will be treated with the highest secrecy.

### **RESULTS:**

**Table (1):** Demographic characteristics of the studied nurses (n=50): shows that, most of the studied nurses were in the age group from 20 to less than 30 years with a mean age

was 29.26 years. Regarding their educational level, 52.0% of studied nurses have Technical Secondary school of nursing, and 96.0% of them work in the intensive care unit. Their experience ranged between 1 and 25 years, the median experience was 6 years and regarding courses, 84% of them had CPR courses.

**Table (2)** Nurses' practice before, after, and 3 months after the program regarding the care of patients with cerebral stroke by observational checklist. Regarding nurses' practice regarding the care of stroke before and after the program, it was significantly different after the program when compared to corresponding values before the program regarding the care of stroke. The difference 3 months after the program, is still statistically significant. However, the difference at 3 months when compared to values after the program showed a non-significant difference indicating that, the program is still effective after 3 months

**Table (3):** Total score of nurse's practice regarding care of patients with cerebral stroke throughout all phases of the program indicates that the 80.0% of the total nurses' practice was unsatisfactory before the program, while 96.0% of the total nurses' practice was satisfactory immediately after the program as well as, 92.0% of them shows a satisfactory practice in follow up 3 months after the program.

**Table (4):** Differences in the total score of nurses' practice in the care of patients with cerebral stroke.

Shows there was a significant difference in the total score of nurses' practice regarding cerebral stroke throughout the program intervention between post-test and preprogram ( $P < 0.001$ ), follow up after 3months, and pre-program ( $P < 0.001$ ). While there was no statistically significant difference between immediately post and follow up were ( $P = 0.32$ ).

**Table (5):** Relation between total nurses' practice & Demographic characteristics of study nurses during care of patients with cerebral stroke. It illustrates that there was a significant relation between demographic characteristics of the studied nurses and their practice related to job and educational level pre, post immediately, and 3 months after educational program implementation.

**Table (1):** Demographic and work data characteristics of studied nurses

<b>Age (years):</b>		
20<30	41	82.0
30<40	7	14.0
40-50	2	4.0
Mean±SD;	29.26±4.42	
Min:Max	23-45	
<b>Education:</b>		
Bachelor's degree in nursing	8	16.0
Technical institute of nursing	16	32.0
Technical Secondary school of nursing	26	52.0
<b>Department:</b>		
Internal Medicine	2	4.0
Intensive Care Unit	48	96.0
<b>Experience (year):</b>		
1<10	44	88
10<20	4	8.0
>20	2	4.0
(mean±SD);	7.16±4.67;	
range; median	1- 25; 6.0	
<b># courses:</b>		
CPR	42	84
ICU	10	20.0
Infection control	6	12.0
Emergency	2	4.0
Burns	1	2.0
Pediatrics	1	2.0
Cardiac catheterization	1	2.0
BLS	34	68.0
Quality	1	2.0
Patient health and safety	2	4.0
Critical care	5	10.0
Total number of courses (mean±SD);	2.1±1.09;	
range; median	0-7; 2	

# more than one answer

**Table (2):** Nurses' practice before, after, and 3months after the program regarding the care of patients with cerebral stroke by observational checklist

Items		Before		After		At 3 months		Z1, P1	Z2, P2	Z3, P3
		N	%	N	%	N	%			
1- Airway, respiration and cardiovascular support	<b>Not Done</b>	39	78.0	5	10.0	5	10.0	2.17, 0.030*	1.85, 0.06*	0.34, 0.72
	<b>Done</b>	11	22.0	45	90.0	45	90.0			
2. Monitor hemodynamics every two hours	<b>Not Done</b>	46	92.0	4	8.0	4	8.0	5.37, 0.001*	4.47, 0.001*	0.001, 1.00
	<b>Done</b>	4	8.0	46	92.0	46	92.0			
3- Neurovascular assessment every hour or according to need	<b>Not Done</b>	34	68.0	6	12.0	6	12.0	7.09, <0.001*	7.09, <0.001*	0.001, 1.00
	<b>Done</b>	16	32.0	44	88.0	44	88.0			
4- Best look	<b>Not Done</b>	36	72.0	4	8.0	4	8.0	1.12, 0.026*	0.83, 0.04*	0.29, 0.76
	<b>Done</b>	14	28.0	46	92.0	46	92.0			
5- Visual	<b>Not Done</b>	30	60.0	5	10.0	5	10.0	4.46, <0.001*	4.65, <0.001*	0.21, 0.83
	<b>Done</b>	20	40.0	45	90.0	45	90.0			
6- Facial palsy	<b>Not Done</b>	40	80.0	4	8.0	4	8.0	2.01, 0.044*	2.01, 0.044*	0.001, 1.00
	<b>Done</b>	10	20.0	46	92.0	46	92.0			
7- Hand movement	<b>Not Done</b>	32	64.0	6	12.0	6	12.0	8.52, <0.001*	8.43, <0.001*	1.00, 0.37
	<b>Done</b>	18	36.0	44	88.0	44	88.0			
8- Limb movement	<b>Not Done</b>	29	58.0	4	8.0	4	8.0	7.09, <0.001*	7.09, <0.001*	0.001, 1.00
	<b>Done</b>	21	42.0	46	92.0	46	92.0			
9- Eye swing	<b>Not Done</b>	39	78.0	5	10.0	6	12.0	0.39, 0.69	0.39, 0.69	0.001, 1.00
	<b>Done</b>	11	22.0	45	90.0	44	88.0			
10- Sensation	<b>Not Done</b>	36	72.0	5	10.0	5	10.0	2.72, 0.006*	2.72, 0.006*	0.001, 1.00
	<b>Done</b>	14	28.0	45	90.0	45	90.0			

[Continued 1]

Items		Before		After		At 3 months		Z1, P1	Z2, P2	Z3, P3
		N	%	N	%	N	%			
11-Best language	<b>Not Done</b>	36	72.0	2	4.0	2	4.0	7.23,	7.44,	0.09,
	<b>Done</b>	14	28.0	48	96.0	48	96.0	<0.001*	<0.001*	0.92
12- Difficult speech	<b>Not Done</b>	32	64.0	6	12.0	6	12.0	2.80,	3.01,	0.31,
	<b>Done</b>	18	36.0	44	88.0	44	88.0	0.005*	0.003*	0.75
13- Inattention	<b>Not Done</b>	40	80.0	3	6.0	3	6.0	0.66,	0.66,	0.001,
	<b>Done</b>	10	20.0	47	94.0	47	94.0	0.50	0.50	1.00
14- Observation for convulsions	<b>Not Done</b>	36	72.0	5	10.0	5	10.0	2.80,	3.01,	0.28,
	<b>Done</b>	14	28.0	45	90.0	45	90.0	0.005*	0.003*	0.77
15- Monitoring of blood sugar levels 140-180 mg/dl and treatment	<b>Not Done</b>	47	94.0	4	8.0	4	8.0	0.001,	0.001,	0.001,
	<b>Done</b>	3	6.0	46	92.0	46	92.0	1.00	1.00	1.00
16- blood sugar < 60mg/dl for hospital protocol	<b>Not Done</b>	50	100.0	4	8.0	4	8.0	2.14,	2.14,	0.001,
	<b>Done</b>	0	0.0	46	92.0	46	92.0	0.032*	0.032*	1.00
17- Prophylaxis against DVT	<b>Not Done</b>	36	72.0	4	8.0	5	10.0	1.53,	1.77,	0.27,
	<b>Done</b>	14	28.0	46	92.0	45	90.0	0.012*	0.08*	0.78
18- keep right patient position	<b>Not Done</b>	45	90.0	5	10.0	5	10.0	7.03,	7.21,	0.09,
	<b>Done</b>	5	10.0	45	90.0	45	90.0	<0.001*	<0.001*	0.92
19- preserve the head of the bed elevated by 30°	<b>Not Done</b>	46	92.0	4	8.0	4	8.0	8.29,	8.06,	1.00,
	<b>Done</b>	4	8.0	46	92.0	46	92.0	<0.001*	<0.001*	0.31
20- keep head in neutral position	<b>Not Done</b>	50	100.0	5	10.0	6	12.0	9.85,	9.65,	1.00,
	<b>Done</b>	0	0.0	45	90.0	44	88.0	<0.001*	<0.001*	0.31
21- regular checks for skin integrity	<b>Not Done</b>	45	90.0	5	10.0	5	10.0	1.28,	1.53,	0.29,
	<b>Done</b>	5	10.0	45	90.0	45	90.0	0.02*	0.012*	0.77
22- supporting surfaces	<b>Not Done</b>	44	88.0	5	10.0	5	10.0	1.75,	1.75,	0.001,
	<b>Done</b>	6	12.0	45	90.0	45	90.0	0.04*	0.04*	1.00
23- avoid high humidity	<b>Done</b>	50	100.0	4	8.0	4	8.0	7.85,	7.67,	0.34,
	<b>Not Done</b>	0	0.0	46	92.0	46	92.0	<0.001*	<0.001*	0.72
24-Keep nutrition and --	<b>Done</b>	48	96.0	6	12.0	6	12.0	8.20,	7.98,	0.45,
	<b>Not Done</b>	2	4.0	44	88.0	44	88.0	<0.001*	<0.001*	0.64
25- Regular change of position	<b>Not Done</b>	50	100.0	5	10.0	5	10.0	1.75,	1.75,	0.001,
	<b>Done</b>	0	0.0	45	90.0	45	90.0	0.08	0.08	1.00
26-Good skin cleaning	<b>Not Done</b>	50	100.0	5	10.0	6	12.0	1.20,	1.47,	0.001,
	<b>Done</b>	0	0.0	45	90.0	44	88.0	0.001*	0.001*	1.00

[Continued 2]

Items		Before		After		At 3 months		Z1, P1	Z2, P2	Z3, P3
		N	%	N	%	N	%			
27-Special beds	<b>Not Done</b>	50	100.0	7	14.0	7	14.0	8.76, <0.001*	8.76, <0.001*	0.001, 1.00
	<b>Done</b>	0	0.0	43	86.0	43	86.0			
28- Fluid charts for input and output	<b>Not Done</b>	35	70.0	5	10.0	5	10.0	1.17, 0.024*	1.44, 0.015*	0.30, 0.75
	<b>Done</b>	15	30.0	45	90.0	45	90.0			
29- check constipation and intestine function	<b>Done</b>	18	36.0	4	8.0	4	8.0	8.78, <0.001	8.71, <0.001*	0.39, 0.61
	<b>Not Done</b>	32	64.0	46	92.0	46	92.0			
30- Check for infection signs	<b>Not Done</b>	35	70.0	4	8.0	5	10.0	1.83, 0.04*	2.07, 0.038*	0.25, 0.80
	<b>Done</b>	15	30.0	46	92.0	45	90.0			
31- Check for bleeding signs	<b>Not Done</b>	27	54.0	5	10.0	5	10.0	1.14, 0.025*	1.39, 0.016*	0.25, 0.80
	<b>Done</b>	23	46.0	45	90.0	45	90.0			
32- Advice patient to regular exercise	<b>Not Done</b>	32	64.0	7	14.0	7	14.0	9.00, <0.001*	8.78, <0.001*	1.00, 0.37
	<b>Done</b>	18	36.0	43	86.0	43	86.0			
33- Healthy nutritional system	<b>Not Done</b>	31	62.0	5	10.0	5	10.0	0.66, 0.20*	0.95, 0.034*	0.29, 0.76
	<b>Done</b>	19	38.0	45	90.0	45	90.0			
34-Start feeding within 7 days	<b>Not Done</b>	50	100.0	6	12.0	6	12.0	9.22, <0.001*	8.99, <0.001*	1.00, 0.37
	<b>Done</b>	0	0.0	44	88.0	44	88.0			
35- check for dysphagia	<b>Not Done</b>	35	70.0	5	10.0	5	10.0	8.52, <0.001*	8.44, <0.001*	0.57, 0.56
	<b>Done</b>	15	30.0	45	90.0	45	90.0			
36- use NG tubes for those with dysphagia	<b>Not Done</b>	30	60.0	5	10.0	5	10.0	4.79, <0.001*	4.50, <0.001*	1.00, 0.31
	<b>Done</b>	20	40.0	45	90.0	45	90.0			
37- use food supplementation	<b>Not Done</b>	37	74.0	5	10.0	5	10.0	3.62, <0.001*	3.62, <0.001*	0.001, 1.00
	<b>Done</b>	13	26.0	45	90.0	45	90.0			
38- Oral hygiene protocols	<b>Not Done</b>	41	82.0	5	10.0	5	10.0	8.33, <0.001*	8.12, <0.001*	0.46, 0.64
	<b>Done</b>	9	18.0	45	90.0	45	90.0			
39- Social support	<b>Not Done</b>	30	60.0	5	10.0	5	10.0	3.31, 0.001*	2.85, 0.004*	1.00, 0.31
	<b>Done</b>	20	40.0	45	90.0	45	90.0			
40- Notify doctor about any problems	<b>Not Done</b>	35	70.0	7	14.0	7	14.0	8.23, <0.001*	8.14, <0.001*	0.42, 0.67
	<b>Done</b>	15	30.0	43	86.0	43	86.0			
41- Documentation	<b>Not Done</b>	28	56.0	4	8.0	5	10.0	0.78, 0.43	0.55, 0.57	0.27, 0.78
	<b>Done</b>	22	44.0	46	92.0	45	90.0			
<b>Total</b>		10	20%	48	96%	46	92%	4.021 0.001*	5.454 0.001*	0.254 .0245

P1: comparison between before and after the program;

P2: Comparison between before program and three months after program:

P3: comparison between direct after program and three months after program,

\* indicate significance

**Table (3):** Total score of nurse's practice regarding care of patients with cerebral stroke throughout all phases of the program (No=50)

Items	Before Program		Immediately After		3 months After	
	N	%	N	%	n	%
<b>Satisfactory</b>	10	20.0	48	96.0	46	92.0
<b>Unsatisfactory</b>	40	80.0	2	4.0	4	8.0
<b>mean±SD</b>	13.96±8.86		43.44±3.92		43.14±4.49	

**Table (4):** Differences in the total score of nurse's practice regarding care of patients with cerebral stroke throughout all phases of the program (No=50)

Items	Before Program	Immediately After	3 months After
<b>Post_pre</b>	t= 21.21, p < 0.001**		
<b>F3_pre</b>	t= 20.87, p < 0.001**		
<b>F3_post</b>	t = 1.0, p =0.32 (NS)		

**t:** paired sample t-test    \* significant P<0.05    \*\* significant P<0.01    **NS** = non-significant (p > 0.05)

**N.B:-** Pre= pre-program    **Post**= immediately after program    Follow up = **F3** (after 3 months)

**Table ( 5):** Relation between total nurses’ practice & Demographic characteristics of study nurses during care of patients with cerebral stroke.

Variables	Nurses’ practice in different program phases								
	Before Program		$\chi^2$ (P) value	Immediate post program		$\chi^2$ (P) value	3 months after program		$\chi^2$ (P) value
	Unsatisfactory n=40	Satisfactory n=10		Unsatisfactory n=2	Satisfactory n=48		Unsatisfactory n=4	Satisfactory n=46	
<b>Age (years):</b>									
20<30	32(80.0%)	9(90.0%)	1.143	2(100.0%)	39(81.3%)	0.812	3(75.0%)	38(82.6%)	0.576
30<40	6(15.0%)	1(10.0%)	0.565	0(0.0%)	7(14.6%)	0.666	1(25.0%)	6(13.0%)	0.750
40-50	2(5.0%)	0(0.0%)		0(0.0%)	2(4.2%)		0(0.0%)	2(4.3%)	
<b>Job:</b>									
Nurse					2(4.2%)			2(4.3%)	
Technician	2(5.0%)	1(10.0%)	<b>2.970</b>	1(50.0%)	21(43.8%)	<b>7.781</b>	1(25.0%)	19(41.3%)	<b>5.537</b>
nurse	20(50.0%)	2(20.0%)	<b>0.022*</b>	1(50.0%)	)	<b>0.020*</b>	3(75.0%)	)	<b>0.019*</b>
Special Nurse	18(45.0%)	7(70.0%)		0(0.0%)	25(52.1%)		0(0.0%)	25(54.3%)	
<b>Level of education :</b>									
Higher [Bachelor]	7(17.5%)	1(10.0%)	<b>1.623</b>	2(100.0%)	6(12.5%)	<b>4.427</b>	3(75.0%)	5(10.9%)	<b>6.406</b>
Middle Institute	14(35.0%)	2(20.0%)	<b>0.044*</b>	0(0.0%)	16(33.3%)	<b>0.035*</b>	1(25.0%)	)	<b>0.041*</b>
Secondary school	19(47.5%)	7(70.0%)		0(0.0%)	26(54.2%)		0(0.0%)	26(56.5%)	
<b>Experience(year):</b>									
1<10	34(85.0%)	10(100.0%)		2(100.0%)	42(87.5%)		4(100.0%)	40(87.0%)	
10<20	4(10.0%)	0(0.0%)	2.876	0(0.0%)	)	0.523	0(0.0%)	)	1.069
>20	2(5.0%)	0(0.0%)	0.237	0(0.0%)	4(8.3%)	0.770	0(0.0%)	4(8.7%)	0.586
					2(4.2%)		0(0.0%)	2(4.3%)	

\*Significant (P<0.05)

\*\*Significant (P<0.01)

$\chi^2 = \text{chi-}$

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**DISCUSSION:**

The outcomes of this study address two major issues: first, the demographic and occupational data of nursing students, and second, the nursing practice care of stroke patients during the program intervention.

A total of 50 nurses, all of whom were female, were included in this study based on demographic characteristics and job-related data. More than three-quarters of the population is in their 20s and 30s. In addition, approximately half of them have a nursing degree from a college. According to the job-related data characteristics of the surveyed nurses, around three-quarters have a work experience ranging from one year to fewer than ten years, with an average of six years. In terms of training programs, it was discovered that none of the nurses surveyed had had any training in the care of stroke patients. Before the start of the project, patients received poor care.

In terms of nurse practice, a recent study suggests that the nurses evaluated have poor skills in assessing stroke patients' airways, breathing, circulation, impairment, and exposure. According to the researchers, this outcome demonstrates a disregard for the most important aspect of care, in which carers take life-saving actions. This is due to a lack of job description, treatment alternatives, motivation, interest, and caretakers, as well as a lack of training and management assistance, resulting in work overload. This outcome is in line with (Khatab, et al., 2019).

The National Institutes of Health Stroke Scale (NIHSS) has become a widely used measure for determining the severity of a stroke and analyzing patient outcomes after therapy. The NIHSS is a 42-point rating scale, with 0 indicating no neurological impairment and 42 signifying the worst possible result. It examines six primary areas of neurological function: (1) loss of consciousness, (2) visual function, (3) motor function, (4) sensory and neglect (ignoring impulses on one side of the body), (5) cerebellum function, and (6) language (Urden et al., 2019).

The National Institute of Health Stroke Scale (NIHSS) was developed by stroke teams and is now used by caregivers to track neurological deficits in stroke patients and to record stroke severity (2018, Honan & Esposito,2018).

The current study found that after participating in a treatment plan, the overall practice scores for neurological assessment of stroke patients using the NIHSS were higher than pre-implementation in the analyzed sample. After completing the course, the total score is higher than the total score after three months. This finding is in line with (Abd Elmegeid et al., 2019), who conducted a study in Cairo on "the effect of educational

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programs on nurses' performance in caring for cerebrovascular stroke patients," and found that the majority of nurses had an unacceptable level of understanding regarding CVS care.

From the researcher's point of view, this decrease could be due to the lack of availability of the scale format in nursing documents, insufficient supervisory tracking of applications, a lack of supervision, a lack of ongoing professional training, and a lack of instructional videos in Arabic, particularly at the NIHSS. Some participants also felt that using the NIHSS was difficult and time-consuming and that it was not their responsibility.

This finding is supported by research findings (Ahamed & Dutta, 2017), which were published in the paper "Effectiveness of Nurses Practice Program Teaching Programs Associated with NIHSS Scales for Neurology Clients in Selected Hospitals in Kolkata." That is the case. Nurses' mean practice scores on the NIHSS were higher after exposure to the educational program than before, according to a study of 60 nurses. The results of this study correspond with those of (Yeganeh et al., 2019), who discovered that the majority of study nurses did not receive CVS-related training, and with those of (Zidan, et al., 2017), who looked at the influence of creating treatment regimens for acute stroke care.

In line with (Shehab, et al., 2018), who investigated the impact of educational programs on nurses' practice in the Suez Canal University Hospital Intensive Care Unit when caring for patients with traumatic brain injury, (Mohammad, 2018), who investigated the performance of ward nurses in intensive care medicine in caring for patients with head injuries: an educational intervention.

From the researcher's point of view, this could be attributed to lacking interest of in hospital administration in conducting educational programs, especially in critical care units about caring for patients with CVS in ICU and critical care units is very important to improve their practice that affects positively on the quality of care for such group of patients.

Finally, most nurses had unsatisfactory and poor overall practice scores in stroke patient care before the program, but most of them instantly improved their overall practice after the training intervention. This can be explained by the fact that not all nurses who have studied have participated in stroke patient care training courses. Take into account the program's positive impact on nurse practice as well as the significance of its implementation.

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**CONCLUSION:**

The majority of nurses studied were found to be unsatisfactory in their care of stroke patients, according to the current data.

**RECOMMENDATIONS:**

**In the light of the study results, the following recommendations are proposed**

- Provide a manual with all of the necessary practical steps for caring for stroke patients.
- Hospital directors and nurses should be encouraged to attend national and international conferences, seminars, and training sessions on the Ministry of Health's stroke patient care.
- Encourages more research to be conducted to develop and execute a stroke patient care training program for nurses at Port Said General Hospital.

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**تأثير برنامج تعليمي على أداء الممرضات فيما يتعلق برعاية مرضى السكتة الدماغية**

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**الخلاصة**

يشير مصطلح "السكتة الدماغية" عادة إما إلى احتشاء دماغي أو إلى نزيف دماغي . على الرغم من أنها ستختلف اعتمادًا علي (العرق ، العمر ، الأمراض المصاحبة) ، فإن نسبة الاحتشاءات إلى النزيف هي حوالي 4 إلى 1. يمكن أن تحدث احتشاءات دماغية بسبب العديد من الامراض ، ولكن جميعها تنتهي بانسداد الشريان أو الوريد الدماغي. . هدف الدراسة: تقييم تأثير برنامج تعليمي على ممارسات الممرضات فيما يتعلق برعاية مرضى السكتة الدماغية. وقد تم استخدام منهج شبه تجريبي لإجراء الدراسة. في وحدة العناية المركزة بمستشفيات بورسعيد العامة علي خمسين ممرضة وقد استخدمت في هذه الدراسة استمارة ملاحظة لتقييم أداء وممارسات الممرضات فيما يتعلق برعاية مرضى السكتة الدماغية وقد اظهرت الدراسة تحسن ملحوظ فيما يتعلق بممارساتهم تجاه العناية بمرضى السكتة الدماغية بعد تنفيذ البرنامج التعليمي. الخلاصة: كان هناك فرق معتد به إحصائيًا في ممارسة واداء الممرضات قبل وبعد البرنامج التعليمي . التوصيات: تقديم برنامج تعليمي وتدريب عملي للتأكد من مستوى الرعاية المقدمة من قبل الممرضات لتحسين ممارساتهم وادائهم فيما يتعلق برعاية مرضى السكتة الدماغية.

**الكلمات المرشدة:** استمارة ملاحظة، السكتة الدماغية ،برنامج تعليمي ، ممارسة الممرضات.