Nurses' Practice to Prevent Complications after Ischemic Stroke and Improve Patient Outcomes

Khadija Mohammed Jassim and Widad K. Mohammed

ABSTRACT

Objective: To determine the nurses' practices about the prevention of complications after ischemic stroke.
Study Design: Pre-experimental study
Place and Duration of Study: This study was conducted at the AL-Basrah Teaching Hospitals, AL-Basrah Governorate from 16th April 2024 to 30th October 2024.
Methods: Twenty nurses, both male and female, who cared for stroke patients made up a non-probability sample.
Results: The nurses' practices do not appear to have a statistically significant effect on the clinical outcome of stroke patients, none of which are statistically significant (p-values of 0.782).
Conclusion: The nurses' practices do not appear to have a statistically significant effect on the clinical outcome of patients' strokes.
Key Words: Nurses, Practice, Complications, Ischemic Stroke

INTRODUCTION

With an estimated cost of more than $721 billion, cerebrovascular accidents (CVAs), sometimes referred to as strokes, continue to rank as the second leading cause of mortality and the third leading cause of disability globally. The World Health Organization reports that 20,793 CVA-related deaths occurred in Iraq, accounting for 14.19 percent of all fatalities.[1]

One of the main causes of death and disability in the globe is stroke. Acute ischemic stroke (AIS) affected 77.2 million of the 101.5 million stroke victims worldwide in 2019. In the US, ischemic strokes make up 87% of all strokes, but subarachnoid hemorrhage (SAH) and intracranial hemorrhage (ICH) make up 3% and 10% of all strokes, respectively. By the age of 80, the chance of having a silent stroke is about 100%, although the lifetime risk of having an apparent stroke is roughly one in four.[2]

Several elements have been established as stroke risk factors. These factors are separated into two categories: modifiable and non-modifiable. Diabetes, asymptomatic carotid artery stenosis, hypertension (HTN), age, cholesterol, smoking, and non-valvar atrial

College of Nursing, University of Baghdad.

Correspondence: Khadija Mohammed Jassim, PhD. Scholar, College of Nursing, University of Baghdad.
Contact No: +964 770 670 9917
Email: khadija.mohammed@uobasrah.edu.iq

fibrillation are among the risk factors for ischemic stroke that have been discovered.[3]

In the Middle Eastern nation of Iraq, coronary heart disease and stroke are common conditions seen in clinical settings. In the Stroke Collaborators' 2019 Global Burden of Disease Report, the incidence rates of stroke in Iraq varied from 196.2 to 218.3 per 100,000. Additionally, it is projected that over 30% of Iraqis are obese, 38% smoke, 14% have diabetes, and 35.8% have hypertension. Additionally, a lot of Iraqis report leading unhealthy lives that include eating a lot of high-calorie meals and not exercising.[4]

Choosing the right kind and degree of rehabilitation for both ischemic and hemorrhagic strokes is a top consideration for stroke patients while they are in the hospital. In addition to treatment, secondary prevention aids in the management of neurological disability-related consequences.[5]

Infection is a significant clinical consequence that stroke survivors face. Thirty percent have been reported to suffer post-stroke sequelae, with urinary tract infections accounting for one-third and pneumonia for one-third. Despite having comparatively comparable incidence rates, the two illnesses show quite different clinical pathways.[6]

An indwelling urinary catheter raises the risk of infection by 3% to 7% every day. About 25% of all hospitalized patients experience indwelling at least once a year, and 10% get a urinary tract infection. Chronic UTIs are widespread, dangerous, and expensive.[7]

To deliver excellent, patient-centered care, nurses who care for stroke patients need continual specialized training. Since they are essential members of the stroke

neurology team, they must receive educational training. Enhancing the abilities needed for effective administration is essential.[5]

METHODS

This pre-experimental study design was used to guide this study, with the application of nursing care practices for all study participants, and performed post-test for the same participants after the researcher applied the nursing care practices to evaluate the effect of nursing care practices to prevent complications 3 months after ischemic stroke and improve patient outcomes in AL-Basrah teaching hospitals in AL-Basrah governorate from AL-Basrah teaching hospitals in the AL-Basrah Governorate from 16th April 2024 to 30th October 2024. AL-Basrah Teaching, AL-Sader Teaching, and AL-Mawani Teaching Hospital were the three hospitals where the AL-Basrah government conducted the study. Twenty nurses, both male and female, who cared for stroke patients made up a non-probability sample was enrolled. Every member of the research sample was exposed to the use of nursing care practices. Nurses who work in the neurology ward, Nurses who provide care for patients with stroke, all levels of education, and staff members who consented to participate in the research were included. All nurses who declined to be involved in the study and nurses who don't work in the neurology ward were excluded. The training was implemented in two lectures given to the nurses; the first lecture was given on the first day, and the second lecture was given on the second day, over two weeks for three days (Tuesday, Wednesday, and Thursday). The instrument of the present study was an observational checklist that used the Modified Rankin Scale (mRS), the Center for Disease Control and Prevention, and the Braden scale; the observational checklist consists of (3) parts. The gathering of demographic information from the nurses is the focus of this section. It includes (5) items relative to age, sex, educational level, years of experience, and working hospital. The observational checklist related to assessing the extent of improvement or deterioration over time of stroke consisted of (6) responses. These are scoring and rating (poor= 1 – 1.33, Fair= 1.34 – 1.66, Good= 1.67 – 2) according to Apply (2) and Not Apply (1).

RESULTS

The mean age was 32.7±8.7 years and the largest proportion of nurses 45% between 20–29 years. 45% of nurses were females and 55% were males. Half of the nurses 50% hold a diploma, while 40% have completed preparatory school education. Only 10% have a bachelor's degree in nursing. Nurses who have 11 years of experience constitute the largest group 40%, followed by those with 1–5 years 35%. Nurses belonged to Basrah Teaching Hospital 35% and Al-

Sader Teaching Hospital 35%, while Mawani Teaching Hospital has a slightly smaller proportion 30% (Table 1).

Table No. 1: Distribution of nurses according to their socio-demographic characteristics (n=20)

Characteristics		No.	%
Age (years)	20 – 29	9	45
	30 – 39	5	25
	40 – 49	5	25
	50 and more	1	5
Gender	Male	11	55
	Female	9	45
Level of education	Preparatory school	8	40
	Diploma	10	50
	Bachelor	2	10
Years of experience	1 – 5	7	35
	6 – 10	5	25
	11 and more	8	40
Working Hospital	AL-Basra Teaching Hospital	7	35
	AL-Sader Teaching Hospital	7	35
	AL-Mawani Teaching Hospital	6	30

Nurses demonstrate strong adherence to practices related to the nursing care of aspiration pneumonia in stroke patients, with a high percentage applying most of the recommended observations. Key practices, such as monitoring for fever over 38.0°C, leukopenia or leukocytosis, new purulent sputum, increased respiratory secretions, shortness of breath, and changes in phlegm color, all show 75-85% compliance, leading to "Good" evaluation scores ranging from 1.75 to 1.85. Additionally, practices like assessing deterioration in gas exchange, conducting blood cultures, and monitoring for worsening cough also exhibit good compliance. However, the assessment of crackles or bronchial breathing sounds showed a lower compliance rate, with only 65% of nurses applying this observation, resulting in a "Fair" evaluation score (1.65). The highest level of compliance was observed for chest X-ray, with 90% of nurses applying this practice, earning the highest score of 1.90 ("Good") [Table 2].

Nurses are generally applying good practices related to the nursing care of pressure ulcer in stroke patients. High compliance is observed in key areas, including nutrition (90% adherence, resulting in the highest score of 1.90, "Good") and sensory perception, movement, and humidity (all showing 80-85% compliance, with scores ranging from 1.80 to 1.85, "Good"). Friction and shear, while still demonstrating a relatively high level of adherence (75%), receive a slightly lower score (1.75, "Good"). The assessment of activity showed the lowest compliance, with only 75% of nurses applying

this practice, also resulting in a "Good" evaluation (1.75) [Table 3].

Mixed adherence to nursing practices for the identification and care of urinary tract infections (UTIs) in stroke patients showed. Several observations, such as fever over 38.0°C, suprapubic tenderness, purulent drainage, and imaging tests (e.g., CT scan, ultrasound, MRI), show good compliance, with 70-90% of nurses applying these practices, resulting in "Good" evaluation scores (ranging from 1.70 to 1.90). Notably, the urine culture test to identify bacterial presence with a threshold of ≥105 CFU/ml received the highest compliance (90%), earning a "Good" score of 1.90. However, other indicators, such as cost overtebral angle pain, urinary frequency, urinary urgency, dysuria, lethargy, and vomiting, show more moderate adherence, with compliance rates ranging from 45% to 60%. These practices received "Fair" evaluations, with scores ranging from 1.45 to 1.60. The presence of urinary urgency (45% compliance) received the lowest adherence, reflecting an area that may require more focused attention (Table 4).

Nurses demonstrate strong adherence to the assessment of clinical outcome of patients, as measured by the modified Ranking Scale (mRS), for stroke patients. All nurses applied the mRS practices with 80%, with a mean score of 1.80, this reflect good nurses' practices and good clinical outcome in patients with stroke (Table 5). The nurses' practices do not appear to have a statistically significant effect on the clinical outcome of stroke patients, none of which are statistically significant (p=0.524) [Table 6]. The practices of nurses and their age group do not significantly (p = 0.704) correlate (Table 7). There is no discernible correlation between nurses' practices and their sex as indicated by insignificant statistical p-values among nursing practices scores (Table 8). Nurses' practices are not significantly associated with their nursing educational level as indicated by insignificant (p=0.567) differences among nurses' practices (Table 9). The years of experience of nurses and their practices do not significantly (p=.784) correlate with nursing practices (Table 10).

Table No. 2: Evaluation of nurses' practices related to "identifies aspiration pneumonia" for patients with stroke (N=20)

The nurse observes	Scale	No. (%)	Mean	Evaluation
Presence of fever of more than 38.0 degrees	Not apply	4 (20%)	1.80	Good
	Apply	16 (80%)		
Leukopenia (≥ 4000 WBC/mm^3) or leukocytosis (≥ 12000 WBC/mm^3)	Not apply	5 (25%)	1.75	Good
	Apply	15 (75%)		
New presence of purulent sputum	Not apply	4(20)	1.80	Good
	Apply	16(80)		
Change in phlegm color	Not apply	5(25)	1.75	Good
	Apply	15(75)		
Increased respiratory secretions or increased suction requirements	Not apply	4(20)	1.80	Good
	Apply	16(80)		
Shortness of breath, or tachypnea	Not apply	3(15)	1.85	Good
	Apply	17(85)		
Presence or worsening of cough	Not apply	5(25)	1.75	Good
	Apply	15(75)		
Crackles or bronchial breathing sounds	Not apply	7(35)	1.65	Fair
Deterioration of gas exchange (increased oxygen requirements, or demand on oxygen saturation devices)	Not apply	3(15)	1.85	Good
	Apply	17(85)		
Blood culture to identify bacteria	Not apply	3(15)	1.85	Good
	Apply	17(85)		
Pleural fluid to identify bacteria	Not apply	5(25)	1.75	Good
	Apply	15(75)		
Chest X-ray	Not apply	2(10)	1.90	Good
	Apply	18(90)		

Table No. 3: Evaluation of nurses' practices related to "identifies pressure ulcer" for patients with stroke (N=20)

The nurse observes	Scale	No. (%)	Mean	Evaluation
Sensory perception	Not apply	3 (15%)	1.85	Good
	Apply	17 (85%)		
Humidity	Not apply	4 (20%)	1.80	Good
	Apply	16 (80%)		

Activity	Not apply	5 (25%)	1.75	Good
	Apply	15 (75%)		
Movement	Not apply	3 (15%)	1.85	Good
	Apply	17 (85%)		
Nutrition	Not apply	2 (10%)	1.90	Good
	Apply	18 (90%)		
Friction and shear	Not apply	5 (25%)	1.75	Good
	Apply	15 (75%)		

Table No. 4: Evaluation of Nurses' Practices related to "identifies urinary tract infection" for Patients with Stroke (N=20)

The nurse observes	Scale	No. (%)	Mean	Evaluation
Presence of fever of more than 38.0 degrees	Not apply	5 (25%)	1.75	Good
	Apply	15 (75%)		
Suprapubic tenderness	Not apply	6 (30%)	1.70	Good
	Apply	14 (70%)		
Costovertebral angle pain	Not apply	8 (40%)	1.60	Fair
	Apply	12 (60%)		
Urinary frequency	Not apply	8 (40%)	1.60	Fair
	Apply	12 (60%)		
Urinary urgency	Not apply	11 (55%)	1.45	Fair
	Apply	9 (45%)		
Dysuria	Not apply	7 (35%)	1.65	Fair
	Apply	13 (65%)		
Purulent drainage	Not apply	6 (30%)	1.70	Good
	Apply	14 (70%)		
Lethargy	Not apply	6 (305)	1.50	Fair
	Apply	14 (70%)		
Vomiting	Not apply	8 (40%)	1.60	Fair
	Apply	12 (60%)		
Urine culture to identify bacteria with a volume of ≥105 CFU/ml	Not apply	2 (10%)	1.90	Good
	Apply	18 (90%)		
Blood culture for bacterial identification (ASC/AST) Active Surveillance Culture/Testing	Not apply	3 (15%)	1.85	Good
	Apply	17 (85%)		
Imaging test evidence suggestive of infection. (CT scan, ultrasound, MRI)	Not apply	4 (20%)	1.80	Good
	Apply	16 (80%)		

Table No. 5: Evaluation of nurses' practices related to "the extent of improvement or deterioration over time" for patients with stroke (N=20)

Assessment	Scale	No. (%)	Mean	Evaluation
Modified Ranking Scale	Not apply	4 (20%)	1.80	Good
	Apply	16 (80%)		

Table No. 6: Effect of nurses' practices on clinical outcome of patients with stroke (N=20)

mRS/Practices	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
Nursing practices	-.214	.329	-.307	-.65	.524

				2	

Table No. 7: Association among nurses' practices and their age group (N=20)

Nursing	Age (year)	Mean±SD	r^s	Sig.
Nursing practices	20 – 29	2.78±0.44	-.091	.704
	30 – 39	2.40±0.89		
	40 – 49	2.60±0.54		
	50 and more	3.00±0.58		

r^s = Spearman correlation

Table No. 8: Association among nurses' practices and their sex (N=20)

Practices	Sex	No.	Mean Rank	Mann-Whitney	Z	Sig.
Nursing practices	Male	11	9.23	35.500	-1.065	.287
	Female	9	12.06			

z = z score

Table No. 9: Association among nurses' practices and their educational level in nursing (N=20)

Practices	Qualification	N	Mean Rank	Kruskal-Wallis	Df	Sig.
Nursing practices	Preparatory school	8	9.00			
	Diploma	10	11.10	1.134	2	.567
	Bachelor	2	13.50			

Table No. 10: Association among nurses' practices and their years of experience (N=20)

Nursing	Experience (year)	Mean±SD	r^s	Sig.
Nursing practices	1 – 5	2.71±0.48		
	6 – 10	2.60±0.89	-.065	.784
	11 and more	2.63±0.51		

r^s = Spearman correlation

DISCUSSION

The current study's findings show that, with a mean age of 32.7±8.7 years, the largest proportion of nurses (45%) in the 20–29 age range. The results of this study agree with numerous studies[8-11,] which mention that most of the study samples were between 20 and 29 years old. This result is incompatible with a study conducted by Baiez and Mohammed[12] on nurses; their studied results revealed that (41.7 %) of the sample was aged between (30-39 years). According to the study's findings, 45% of nurses were females and 55% were males. Mohammed[13] reported that 24.7% were males.

In terms of nursing education, 40% of nurses have finished middle school, and 50% of nurses have a diploma. Merely 10% possess a nursing bachelor's degree. Jaddoue[14] found that 50% of nurses had completed high nursing school, is contradictory with this study. These results disagree with numerous studies[15-18,] which mention that most of the study sample has secondary school graduates or less.

The results of the current study reveal that nurses with more than 11 years of experience constitute the largest group (40%), followed by those with 1 to 5 years (35%). This study is incongruent with a descriptive study by Na'el and Mohammed[19] that 76.7% of nurses had experience in a hospital from 1 to 5 years.

This study indicates that nurses demonstrate strong adherence to the assessment of clinical outcomes of patients, as measured by the modified Rankin Scale (mRS), for stroke patients. All nurses applied the mRS practices with 80%, with a mean score of 1.80, this reflects good nurses' practices and good clinical outcomes in patients with stroke. These results are consistent with a cross-sectional descriptive study conducted by Babkair et al[20], which found that 42% of nurses said they used the mRS or other measures more often in stroke units than in the intensive care unit to evaluate patients' physical disabilities.

The present study indicates that the nurses' practices do not appear to have a statistically significant effect on the clinical outcome of stroke patients, none of which are statistically significant (p-values of 0.782). These results contradict with Abd El-Hay et al[21], showed that nurses' understanding and practice of caring for stroke patients significantly improved after the training program (p<0.01).

The result of the study indicates that there is no significant association between nurses' practices and their age group. The overall practices show a slightly positive correlation (r^s=0.171) with age but with no statistically significant (p=0.472).These findings disagree with Atiyah and Khudhur[22], the results of the study showed a strong positive relationship between age and nurses' practices.

The current study showed that insignificant statistical p-values among the total practice scores show that there is no significant correlation between the sex of nurses and their practices. These results are consistent with Zheng et al[23] finding that gender did not significantly differ (p>0.05).

The current study indicates that nurses' practices are not significantly associated with their nursing educational level, as indicated by insignificant differences among overall practices. The findings are congruent with Niyongabo et al[24], that nursing practice ratings and knowledge of PU prevention and treatment were inversely correlated with educational attainment.

According to the current study, there is no discernible correlation between the number of years of experience a nurse has and their assessment, nursing care, or general practices. There are no discernible variations in general practices, according to the p-values. The finding is agreement with Kolankoh et al[25] and were substantially connected with the nurses' care management of patients with acute stroke and job experience.

CONCLUSION

The nurses' practices do not appear to have a statistically significant effect on the clinical outcome of patients with stroke.

Author's Contribution:

Concept & Design or acquisition of analysis or interpretation of data:	Khadija Mohammed Jassim
Drafting or Revising Critically:	Widad K. Mohammed
Final Approval of version:	All the above authors
Agreement to accountable for all aspects of work:	All the above authors

Ethical Approval: No. 'nil' Dated 8.4.2024

REFERENCES

1. Lilu F, Al-Jubouri MB. Challenges facing nurses toward providing care to patients with cerebrovascular accidents: a mixed methods study. Bahrain Med Bul 2024;46(1):1905-15.
2. Hasan TF, Hasan H, Kelley RE. Overview of acute ischemic stroke evaluation and management. Biomed 2021;9(10):1486.
3. Alharbi AS, Alhayan MS, Alnami SK, Traad RS, Aldawsari MA, Alharbi SA, et al. Epidemiology and risk factors of stroke. Arch Pharmacy Prac 2019;10(4): 60-6.
4. Al-Obaidi H, Khidhair Z, Jirjees F, Barakat M, AlSalamat H, Kharaba Z, et al. Factors associated with knowledge and awareness of stroke in the Iraqi population: a cross-sectional study. Frontiers Neurol 2023;14:1144481.
5. Jiyad OS, Muhammed TR. Evaluation of quality of nursing care provided to stroke patients. Resmilitaris 2022;12(2):3572-80.
6. Kalani Z, Ebrahimi S, Fallahzadeh H. Effects of the liaison nurse management on the infectious stroke complications: a randomized controlled trial. BMC Nursing 2022;21(1):29.
7. Kayem AB, Hassan HS. Prevention of indwelling catheter-associated urinary tract infection: An interventional study for nursing staff. Int J Health Sci 2022;6(S2): 15189–98.
8. Noor AM, Hassan H. Effectiveness of an interventional program on nurses practices about prevention of pressure ulcer at the Intensive Care Unit. Kufa J Nursing Sci 2021; 11(1):59-66.
9. Majeed H M, Hassan A F, Al-Ganmi AHA. Nurses' performance and perceived barriers regarding pressure ulcers' prevention for critically ill patients at Baghdad Teaching Hospitals. J Nat Sci Med 2024;7(4): 293-8.
10. Majeed HM, Hassan AF, Jasim AH, Al-Ganmi AH. Protective health behaviors among critical care nurses concerning pressure ulcer prevention for hospitalized patients at Baghdad Teaching Hospitals. Al-Rafidain J Med Sci 2023; 5:205-10.
11. Tiryag AM, Atiyah MA, Khudhair AS. Nurses' knowledge and attitudes toward thyroidectomy: a cross-sectional study. Health Educ Health Promotion 2022;10(3):459-65.
12. Baiez YK, Mohammed WK. Effectiveness of an interventional program on nurses' practices regarding removing and cleaning burn dead tissue. Iraqi Nat J Nursing Specialties 2022;35(1): 110-15.
13. Mohammed EI. The role of spiral computerized tomography in the diagnosis of stroke. Iraqi Nat J Nursing Specialties 2013;26(2): 123-8.
14. Jaddoue B. Assessment of nurses' practices for neurological unconscious patients in intensive care units. Iraqi Nat J Nursing Specialties 2011;24(1): 1-1.
15. Mohammad MA, Abdul-Ra'aoof HH, Razzaq Manahi KA, Tiryag AM. Parents' knowledge and attitudes toward testicular torsion. Bahrain Med Bull 2024;46(1).
16. Tiryag AM, Dawood SB, Jassim SK. Nurses' knowledge and attitudes about enteral feeding complications by nasogastric tube in intensive care units. Rawal Med J 2023;48(3):689-93.
17. Jassim KM, Khudhair AS, Dawood ZS, Tiryag AM. Nurses' knowledge about electrocardiogram interpretation: A cross-sectional study. Rawal Med J 2023;48(4):850.
18. Liu ZY, Wei L, Ye RC, Chen J, Nie D, Zhang G, et al. Reducing the incidence of stroke-associated pneumonia: an evidence-based practice. BMC Neurol 2022;22(1):297.
19. Na'el K A, Mohammed WK. Nurses' knowledge toward care of unconscious adult patients at teaching hospitals in Al-Hilla City. Iraqi Nat J Nursing Specialties 2019;32(1):90-102.
20. Babkair LA, Safhi RA, Balshram R, Safhei R, Almahamdy A, Hakami FH, et al. Nursing care for stroke patients: current practice and future needs. Nurs Rep 2023;13:1236-50.
21. Abd El-Hay SA, Abed Allah AK, Tag El Din EA. Effect of implementing designed educational training program for neurological nurses on clinical outcomes of stroke patients. Clin Nurs Stud 2018;6(4):121.
22. Atiyah H, Khudhur K. Evaluation of nurses' practices toward postoperative wound dressing in surgical wards. Iraqi Nat J Nurs Specialties 2012;25(1):29-39.
23. Zheng D, Li S, Ding Y, Chen H, Wang D, Wang H, et al. Effects of nurse-led hierarchical management care on acute stroke patients: a pilot study to promote stroke-associated pneumonia management. Frontiers Neurol 2023;14:1121836.
24. Niyongabo E, Gasaba E, Niyonsenga P, Ndayizeye M, Ninezereza JB, Nsabimana D, et al. Nurses' Knowledge, attitudes and practice regarding pressure ulcers prevention and treatment. Open J Nursing 2022;12(5):316-33.
25. Kolankoh FA, Mozaffari N, Dashti-Kalantar R, Mohammadi MA. The relationship between acute stroke management and the knowledge of evidence-based care and attitudes toward stroke care among emergency nurses and emergency medical services personnel in Ardabil City in 2021. Turkish J Neurol 2023;29(1):052-9.