Performance of Essential Practices and Self Efficacy in Stroke Care Among Nurses and Midwives at The Adult University Teaching Hospital, Lusaka, Zambia

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Abstract

Background: Stroke is among the leading causes of disability and mortality worldwide, necessitating effective multidisciplinary care practices to optimize patient outcomes. Nurses play a critical role in the provision of stroke care, requiring not only technical proficiency but also a high level of self-efficacy to motivate their delivery of optimal care. This study therefore investigated the essential practices and self-efficacy in stroke care among nurses and midwives at the Adult University Teaching Hospital in Lusaka, Zambia.

Methods: The study employed a descriptive cross-sectional approach that involved use of a structured self-administered questionnaire to collect data from a randomly selected sample of 163 nurses working in various units at the Adult University Teaching Hospital in Lusaka. Univariate and multivariable logistic regression analysis was used to identify predictors of the essential practices performed by nurses in the management of stroke patients at 95% confidence level. Normality of data was tested using the Shapiro-Wilk test as well as inspection of histograms.

Results: Half (50.9%) of the participants reported having never performed essential practices in caring for patients with stroke, while the majority (90.8%) reported high self-efficacy for stroke care. Some of the essential practices that were only performed by a minority of participants included continuous cardiac monitoring of patients (33.8%), administering recombined tissue Plasminogen Activator in divided doses (34.0%), using the Braden Scale in the prediction of stroke patients at high risk of developing pressure ulcers (36.1%), and performing a bedside swallow screen in the first 24 hours after stroke (27.6%). Univariate and multivariable logistic regression analysis revealed no significant predictive effect of various factors, including self-efficacy (P = 0.811, cOR = 0.91, CI = 0.40–2.05) on reported performance of stroke care practices.

Conclusion: Despite the central position occupied by nurses in the management of patients with stroke, their reported performance of essential stroke care practices was low. Despite an overall high self-efficacy, nurses also reported low self-efficacy in performing a few yet critical stroke care practices, such as performing a bedside swallow screening test. This heralds a need for in-house training and for large-scale studies that can investigate the performance of essential stroke care practices using observational approaches to help enhance validity.

Keywords: Essential Practices, Stroke Care, Self-efficacy, Nurses and Midwives

Background

Stroke or cerebral vascular accident (CVA) is the second leading cause of death globally, Donkor, 2018] [1]. Stroke accounts for 11 percent of all deaths and represents the largest cause of adult disability. Although patient survival after stroke has improved, it remains a leading cause of severe disability (Lutz and Green, 2016). Traditionally, CVA has been labeled as a disease of the affluent, but reports have shown that Africa, which is not affluent, bears a heavy burden of CVA (Owolabi et al., 2015). The changing burden of stroke in African countries could be attributed to an epidemiological transition driven by socio-demographic and lifestyle changes (Owolabi et al., 2015). With the changing lifestyles, the incidence of CVA is increasing, and thus, 28 million people are estimated to die in 10 years' time, just in Africa, due to non-communicable diseases, largely CVA [2]. In Zambia, CVA has been documented to affect the younger population, with hypertension being the most common risk factor, and the trend is increasing following the advent of the human immunodeficiency virus/acquired immunodeficiency syndrome and diabetes mellitus.

Stroke care and rehabilitation require a multidisciplinary approach. According to the Stroke Unit Trialists' Collaboration (2007), there is unequivocal evidence of improved outcomes when patients are treated in a stroke unit by multi-disciplinary teams. Multidisciplinary teams made up of medical doctors, nurses, physiotherapists, and occupational therapists perform stroke rehabilitation in all phases and settings, such as hospitals, communities, and clinics (Tibaek, 2018) [3]. Among the multidisciplinary team members, nurses are one of the largest professional workforces working with stroke survivors [4]. According to Al-Humaid et al. (2018), the nursing role in the acute phase of stroke management involves practices such as rapid assessment and triage of patients, ongoing assessment of vital signs to detect improvement or deterioration, and providing or assisting in meeting the respiratory, nutritional, hygiene, elimination, and mobility needs of the patient. In addition, nurses coordinate and accompany the patient's journey of care, liaising with other specialties, facilitating rehabilitation, discharge, and follow-up planning, and providing support to patients and families.

In addition to employing good stroke care management practices, nurses should possess high self-efficacy in stroke care, as it has the potential to motivate them to undertake more care interventions for their patients. According to Olson et al. (2015), provider self-efficacy (SE), or a person's belief that he or she is competent in a specific ability or behavior, is a significant mediator and predictor of motivation and behavior change in new or challenging tasks [5]. Further, provider self-efficacy in stroke care is a critical requirement as it has been shown to improve stroke patient's recovery and mental health status to help mediate caregiver burden and improve perceived social support and mental well-being [6].

Despite the significant role played by nurses in stroke care and rehabilitation as documented in professional literature, literature on stroke care practices and self-efficacy among nurses in Zambia is sparse. This article therefore presents a segment of findings from a larger study that investigated stroke care among nurses and physiotherapists in Zambia. More specifically, the current article presents stroke care practices and self-efficacy among nurses at a teaching hospital in Zambia.

Material and Methods

Study Design

The study design for the larger project from which this article is derived was a parallel mixed-methods approach. For the current article, however, only the quantitative component of the study, which employed a descriptive cross-section design, is reported. This approach allowed for the collection of data on the performance of essential practices in stroke care and self-efficacy among nurses and midwives at the Adult University Teaching Hospital in Lusaka at one point.

Study Site and Population

The study was conducted at the University Teaching Hospital (UTH) Adult Hospital in Lusaka. The following specific units were included in the study: The Emergency Department (ED)-Triage Emergency Room, Adult Emergency Medical Unit, Male and Female Admission Wards, the Main Intensive Care Unit, and the Medical Wards. The UTH Adult Hospital was selected purposefully for this study because it is the main referral center for the entire country with 24-hour emergency services for patients who have acute complaints.

Selection of Participants, Sampling, and Sample Size

The sample size for the current study was calculated using the Krejcie and Morgan formula for a finite population employing a standard proportion of 0.05, a confidence level of 95%, and a margin of error of 5% for a target population size of 287 nurses working in the selected settings of the UTH-Adult hospital. The calculated sample size was 165 participants, of which 163 responded, giving a response rate of 98.8%. A simple random sampling technique was then employed to select participants for the study, thus ensuring a fairly equal representation of the variables for the study. This was accomplished by obtaining participant names from duty rosters on the wards and formulating a sampling framework therefrom. The lottery method of sampling was then used to draw 163 participants from the sampling frame.

Inclusion Criteria

Nurses with a minimum of 6 months of working experience who consented to take part in the study.

Exclusion Criteria

Nurses who were working on a part-time basis in selected wards and units may not have had the same level of interaction with stroke patients as those working on a full-time basis.

Data Collection Plan and Tools

A self-administered questionnaire was used for the study. This questionnaire was adapted from the Stroke Foundation clinical guidelines for stroke management, a quick guide for nursing, and the Nursing and Midwifery Protocols [7, 8]. Included in the questionnaire was a section for the collection of demographic data in addition to data on the performance of essential practices in stroke care among nurses and midwives.

Data Processing and Analysis
Quantitative data was checked for completeness and entered into version 23 of the Statistical Package for Social Sciences (SPSS) for analysis. Descriptive statistics were computed in the form of frequencies. The data on the dependent variable on the role of the nurse in stroke care was collected as categorical data. The categories for the dependent variable were "performed" and "not performed". This entailed the use of chi-square tests of associations and Fisher's exact tests for the bivariate analysis, while binary logistic regression was used to identify predictors of the essential practices performed by nurses in the management of stroke patients. The confidence level for the current study was 95%, with the level of significance being set at 0.05. Normality of data was tested using the Shapiro-Wilk test as well as inspection of histograms.

Results
Baseline Characteristics of Study Participants
Table 1: Baseline Characteristics of Study Participants (n=163)

Characteristics		Frequency (n)	Percent (%)
Gender	Male	31	19.0
	Female	132	81.0
Age in years	Mean (SD)	28.5 (±5.9)	
Years of nursing practice	Median (IQR)	3 (2 – 7)	
Duration at current institution	Median (IQR)	2 (1.5 – 4)	
Religion	Christian	161	98.8
	Muslim	2	1.2
Marital status	Married	86	52.8
	Single	77	47.2
Professional qualification	Registered nurse	135	83.3
	Registered midwife	6	3.7
	Registered nurse midwife	3	1.8
	Critical care nurse	3	1.8
	Bachelor's degree in nursing	7	4.3
	HIV nurse practitioner	1	0.6
	Enrolled nurse	4	2.5
	Nephrology nurse	1	0.6
	Emergency and trauma nurse	2	1.2
Ward/unit of work	Premium department	3	1.9
	Medical ward	117	74.0
	Surgical ward	4	2.5
	Emergency department	14	8.9
	Renal unit	11	7.0
	Intensive care unit	7	4.4
	Outpatient department	2	1.3

IQR= Interquartile Range, SD=Standard Deviation

Table 1 gives an outline of demographic characteristics of the 163 nurses who participated in the study. A large proportion, 132 (81%) of participants were females, while male gender accounted for less than twenty percent 31 (19%) of the study sample. The average age of the participants was 28.5 years (±5.9). The median length of practicing as a nurse was 3 years (IQR, 2 – 7) and the median length of working at the current institution was reported at 2 years (IQR, 1.5 – 4). Almost all 161 (98.8%) par-

ticipants were Christians. Slightly over half 86 (52.8%) were married, whereas 77 (47.2%) were not. The majority 135 (83.3%) of participants were registered nurses, and about three quarters 117 (74%) worked in medical wards.

Participants' Reported Stroke Care Practices
Table 2: Study Participants' Specific self-reported Stroke Care Practices (n=163)

	Activity performed	Yes n (%)	No n (%)
1.	Assessing the Airway, Breathing, Circulation, Disability and Exposure	159 (99.4)	1 (0.6)
2.	Performing Neurological Assessment using a validated Assessment tool	113 (88.3)	35 (11.7)
3.	Monitoring patient's level of consciousness using the Glasgow Coma Scale	161 (99.4)	1 (0.6)
4.	Administer Supplemental oxygen to patients with low Oxygen saturation	155 (98.1)	3 (1.9)
5.	Monitor for major and minor bleeding complications for patients on Thrombolytic Treatment	143 (88.8)	18 (11.2)
6.	Continuous cardiac monitoring up to 72 h or more for patients on Thrombolytic treatment and for 24 to 48h for patients not receiving Thrombolytics	100 (66.2)	51 (33.8)
7.	Measure intake and output	153 (93.9)	10 (6.1)
8.	Positioning head at 25° to 30° for potentially increased intracranial pressure (ICP), until causes of increased ICP can be ruled out by imaging	151 (93.8)	10 (6.2)
9.	Establishing at least two sites for Intravenous access in patients with acute stroke	141 (86.5)	22 (13.5)
10.	Administering IV normal Saline at (75 to 100 mL/h)	118 (76.6)	36 (23.4)
11.	Collecting the following history (Time patient last known well, Time symptoms were first observed, was anyone with patient when symptoms began? If so, who? History of diabetes, hypertension, trauma, seizures)	141 (88.1)	19 (11.9)
12.	Withhold emergency administration of antihypertensive agents unless diastolic blood pressure is >120 mm Hg or systolic blood pressure is >220 mm Hg in Acute Ischaemic Stroke patients who are not treated with thrombolytics.	128 (84.2)	24 (15.8)
13.	Administering recombined tissue Plasminogen Activator (rtPA) in divided doses: 10% is given as a bolus over 1 minute, and the remaining 90% as a continuous infusion over the next 60 minutes.	101 (66.0)	52 (34.0)
14.	Ensuring that all intravenous lines are inserted, Foley catheter if needed and any other indwelling lines or tubes, endotracheal tubes are inserted before administering rtPA	145 (89.5)	17 (10.5)
15.	Keeping Stroke patients in the Emergency Department Nil Per Oral until ability to swallow is assessed	136 (84.5)	25 (15.59)
16.	Administering antipyretics to pyretic stroke patients	143 (87.7)	20 (12.3)
17.	Initiating bowel care and bladder training to decrease incontinence episodes	148 (90.8)	15 (9.2)
18.	Offering a commode, bedpan, or urinal every 2 hours during waking hours and every 4 hours at night.	129 (79.6)	33 (20.4)
19.	Avoiding use of indwelling catheters where possible because of the risk of UTI	122 (76.7)	37 (23.3)
20.	Initiating fall precautions and tell the stroke patient not to ambulate without assistance	144 (91.1)	14 (8.9)
21.	Performing 2 hourly turning in bedridden patients to prevent skin breakdown	159 (97.5)	4 (2.5)
22.	Using the Braden Scale in the prediction of stroke patients at high risk of developing pressure ulcers.	99 (63.9)	56 (36.1)
23.	Starting Range-of-motion exercises in the early phase of acute stroke care once risk has been assessed	147 (94.8)	8 (5.2)
24.	Performing a bedside swallow screen in the first 24 hours after stroke	110 (72.4)	42 (27.6)
25.	Inserting NGT in Patients who cannot swallow.	158 (96.9)	5 (3.1)
26.	Develop and execute a discharge plan for a patient with stroke	140 (87.5)	20 (12.5)

A detailed illustration of specific stroke care practices reported by participants is provided in table 2 above. Nearly all 159 (99.4%) participants reported assessing the Airway, Breathing, Circulation, Disability and Exposure in stroke patients. Furthermore, nearly all participants reported performing the following essential stroke care practices: Monitoring patient's level of consciousness using the Glasgow Coma Scale (99.4%), Administering Supplemental oxygen to patients with low Oxygen saturation (98.1%), Measuring intake and output (93.9), Positioning head at 25° to 30° for potentially increased intracranial pressure (ICP), until causes of increased ICP can be ruled out by imaging (93.8%), Initiating bowel care and bladder training to de-

crease incontinence episodes (90.8%), Initiating fall precautions and tell the stroke patient not to ambulate without assistance (91.1%), Performing 2 hourly turning in bedridden patients to prevent skin breakdown (97.5%), Starting Range-of-motion exercises in the early phase of acute stroke care once risk has been assessed (94.8%), Inserting NGTs in Patients who cannot swallow (96.9%).

Notably, one-third of participants reported not performing the following essential practices: Continuous cardiac monitoring up to 72 hours or more for patients on Thrombolytic treatment and for 24 to 48h for patients not receiving Thrombolytics (33.8%), Administering rtPA in divided doses i.e. 10% as a bolus over 1 minute, and the remaining 90% as a continuous infusion over the next 60 minutes (34.0%), Using the Braden Scale in the prediction of stroke patients at high risk of developing pressure ulcers (36.1%), Performing a bedside swallow screen in the first 24 hours after stroke (27.6%).

Table 3: Participants' Overall Self-Reported Performance of Essential Practices in Stroke Care (n=163)

Self-reported Performance of essential practices	Frequency (n)	Percent (%)
Essential practices performed	80	49.1
Essential practices not performed	83	50.9

Table 3 shows that half 83 (50.9%) of the participants reported having never performed essential practices in caring for patients with stroke. Just under half 80 (49.1%) of the participants reported having performed essential stroke care practices.

Self-Efficacy for Stroke Care
Table 4: Participants' Reported Self-efficacy in Carrying out the Necessary Nursing Measures for Stroke Patients (n=163)

Activity	Confident n (%)	Neutral n (%)	Not Confident n (%)
Assessing the Airway, Breathing, Circulation, Disability and Exposure	133 (85.3)	20 (18.2)	3 (1.9)
Performing Neurological Assessment using a validated Assessment tool	90 (64.3)	29 (20.7)	21 (15.0)
Monitoring patient's level of consciousness using the Glasgow Coma Scale	141 (88.1)	15 (9.4)	4 (2.5)
Identifying Stroke patients for whom Supplemental oxygen is indicated	125 (78.1)	33 (20.6)	2 (1.3)
Monitoring for major and minor bleeding complications for patients on Thrombolytic Treatment	70 (46.1)	69 (45.3)	13 (8.6)
Continuous cardiac monitoring up to 72 h or more for patients on Thrombolytic treatment and for 24 to 48h for patients not receiving Thrombolytics	62 (38.8)	80 (50.0)	18 (11.2)
Measuring intake and output	128 (81.0)	23 (14.6)	7 (4.4)
Positioning head at 25° to 30° for potentially increased intracranial pressure (ICP), until causes of increased ICP can be ruled out by imaging	105 (67.3)	46 (29.5)	5 (3.2)
Establishing at least two sites for Intravenous access in patients with acute stroke	117 (72.7)	37 (23.0)	7 (4.3)
Administer the right type and amount of IV fluids for stroke patients	118 (73.7)	39 (24.4)	3 (1.9)
Collecting the following history (Time patient last known well, Time symptoms were first observed, was anyone with patient when symptoms began? If so, who? History of diabetes, hypertension, trauma, seizures)	105 (68.2)	42 (27.3)	7 (4.5)
Withholding emergency administration of antihypertensive agents unless diastolic blood pressure is >120 mm Hg or systolic blood pressure is >220 mm Hg in Acute Iscahemic Stroke patients who are not treated with thrombolytics.	78 (49.7)	67 (42.7)	12 (7.6)
Administer rtPA in the right doses and frequency	70 (44.9)	63 (40.4)	23 (14.7)
Ensuring that all intravenous lines are inserted, Foley catheter if needed and any other indwelling lines or tubes, endotracheal tubes are inserted before administering rtPA	115 (72.3)	30 (18.9)	14 (8.8)
Keepinging Stroke patients Nil Per Oral until ability to swallow is assessed	105 (65.6)	42 (25.3)	13 (8.1)
Identifying Stroke patients for whom antipyretics are indicated	111 (69.8)	38 (23.9)	10 (6.3)
Initiate bowel care and bladder training	99 (61.9)	47 (29.4)	14 (8.7)
Offer a commode, bedpan, or urinal every 2 hours during waking hours and every 4 hours at night.	102 (63.3)	41 (25.5)	18 (11.2)
Avoiding use of indwelling catheters where possible because of the risk of UTI	108 (67.5)	43 (26.9)	9 (5.6)

Initiating fall precautions and tell the stroke patient not to ambulate without assistance	116 (72.0)	37 (23.0)	8 (5.0)
Performing 2 hourly turning in bedridden patients to prevent skin breakdown	140 (88.0)	17 (10.7)	2 (1.3)
Using the Braden Scale in the prediction of stroke patients at high risk of developing pressure ulcers.	68 (42.8)	47 (29.6)	44 (27.8)
Starting Range-of-motion exercises in the early phase of acute stroke care once risk has been assessed	91 (56.9)	53 (33.1)	16 (10.0)
Performing a bedside swallow screen	79 (49.1)	55 (34.1)	27 (16.8)
Inserting NGT in Patients who cannot swallow.	142 (87.7)	19 (11.7)	1 (1.6)
Developing and execute a discharge plan for a patient with stroke	119 (73.9)	36 (22.4)	6 (3.7)

Participants were asked to indicate their level of confidence in carrying out necessary nursing measures for stroke patients. Findings demonstrated that more than three quarters of participants were confident in performing the following activities: Assessing the Airway, Breathing, Circulation, Disability and Exposure 133 (85.3%); monitoring patient's level of consciousness using the Glasgow Coma Scale 141 (88.1%); Identifying Stroke patients for whom Supplemental oxygen is indicated 125 (78.1%); measuring intake and output 128 (81.0%); measuring intake and output 128 (81.0%); performing 2 hourly turning in bedridden patients to prevent skin breakdown 140 (88.0%); and Inserting NGT in Patients who cannot swallow; 142 (87.7%).

On the other hand, only a minority of participants were confident in performing the following activities: Monitoring for major and minor bleeding complications for patients on Thrombolytic Treatment (46.1%); Continuous cardiac monitoring up to 72 hours or more for patients on thrombolytic treatment and for 24 to 48h for patients not receiving thrombolytics (38.8%); Withholding emergency administration of antihypertensive agents unless diastolic blood pressure is >120 mm Hg or systolic blood pressure is >220 mm Hg in Acute Iscahemic Stroke patients who are not treated with thrombolytics (49.7%); Administer rtPA in the right doses and frequency (44.9%); Using the Braden Scale in the prediction of stroke patients at high risk of developing pressure ulcers (42.8%); and performing a bedside swallow screen (49.1%).

Table 5: Overall Participants Reported Self-efficacy in Carrying out the Necessary Nursing Measures for Stroke Patients (n=163)

Reported self-efficacy in stroke care	Frequency (n)	Percent (%)
Low efficacy	15	9.2
High efficacy	148	90.8

As evident in Table 5, high self-efficacy for stroke care was reported by majority (90.8%) of participants with only 9.2% reported low self-efficacy.

Table 6: Univariate and Multivariable Logistic Regression Analysis Between Self-Reported Performance of Essential Stroke Care Practices and Predictor Variables

Variables	Unadjusted Estimates			Adjusted Estimates		
	COR	p-value	95% CI	AOR	p-value	95% CI
Age	0.98	0.658	0.93 – 1.05	0.98	0.662	0.92 – 1.05
Duration of Nursing Practice	1	0.573	0.99 – 1.00	1	0.819	0.99 – 1.01
Duration at the Institution	1	0.534	0.99 – 1.00	1	0.67	0.98 – 1.01
Gender						
Male	Ref	—	—	Ref	—	—
Female	1.43	0.378	0.65 – 3.15	1.39	0.432	0.61 – 3.18
Work Unit						
Emergency	Ref	—	—	Ref	—	—
Medicine	1.21	0.716	0.43 – 3.44	0.86	0.809	0.27 – 2.81
Surgery	2.57	0.277	0.47 – 14.1	2.05	0.43	0.34 – 12.2
Self-Efficacy in Stroke Care Practices						
Low	Ref	—	—	Ref	—	—
High	2.05	0.208	0.67 – 6.30	2.46	0.164	0.69 – 8.76

COR = Crude odds Ratio AOR= Adjusted Odds Ratio CI= Confidence Interval, Ref = Reference category

Table 6 shows univariate and multivariable analysis of predicators of self-reported performance of essential stroke care practices. Age, duration of nursing practice, duration at the institution, gender, work unit, self-efficacy, attitude and knowledge showed no significant predictive effect on reported performance of stroke care practices at univariate level analysis (all p-values > 0.05). Similarly, keeping all other variables constant, there was no significant predictive effect of age (P: 0.662, cOR: 0.98, CI: 0.92 – 1.05), duration of nursing practice (P: 0.819, cOR: 1.00, CI: 0.99 – 1.01), duration at the institution (P: 0.670, cOR: 1.00, CI: 0.98 – 1.01) and gender (P: 0.432, cOR: 1.93, CI: 0.61 – 3.18) on reported performance of essential stroke care practices. Working in medical ward (P: 0.809, cOR: 0.86, CI: 0.27 – 2.81), surgical ward (P: 0.430, cOR: 2.05, CI: 0.34 – 12.2), knowledge (P: 0.063, cOR: 2.10, CI: 0.96 – 4.61) and self-efficacy in stroke care (P: 0.811, cOR: 0.91, CI: 0.40 – 2.05) also showed no significant predictive effect on reported performance of essential stroke care practices controlling for all other variables.

Table 7: Univariate and Multivariable Logistic Regression Analysis Between Reported Self-efficacy in Stroke Care and Predictor Variables

Variables	Unadjusted Estimates			Adjusted Estimates		
	COR	p-value	95% CI	AOR	p-value	95% CI
Age	1.15	0.039	1.01 – 1.31	1.34	0.016	1.05 – 1.70
Duration of Nursing Practice	1.01	0.25	0.99 – 1.02	0.97	0.064	0.94 – 1.00
Duration at the Institution	1.02	0.113	0.99 – 1.04	1.05	0.032	1.00 – 1.10
Gender						
Male	Ref	—	—	Ref	—	—
Female	1.81	0.346	0.53 – 6.20	5.88	0.042	1.06 – 32.3
Work Unit						
Emergency	Ref	—	—	Ref	—	—
Medicine	14.6	< 0.001	4.18 – 50.6	38.4	< 0.001	6.59 – 22.4
Surgery	2.33	0.501	0.20 – 27.6	20.4	0.035	1.23 – 33.8
Knowledge						
Low	Ref	—	—	Ref	—	—
High	0.85	0.794	0.26 – 2.84	0.56	0.461	0.122 – 2.56
Stroke Care Practices						
Not performed	Ref	—	—	Ref	—	—
Performed	2.05	0.208	0.67 – 6.30	2.54	0.167	0.68 – 9.52
Attitude						
Negative	Ref	—	—	Ref	—	—
Positive	1.37	0.51	0.41 – 4.61	1.29	0.749	0.27 – 6.22

COR = Crude odds Ratio AOR= Adjusted Odds Ratio CI= Confidence Interval, Ref = Reference category

Table 7 shows univariate and multivariable analysis of predicators of reported self-efficacy in stroke care. Univariate analysis showed that participant's age and working in the medical unit had an increasing predictive effect on reported self-efficacy, whereas duration of nursing practice, duration at the health facility, gender, surgical working unit, knowledge, attitude and stroke care practices had no significant predictive effect on reported self-efficacy. Every year increase in age significantly increased the odds of high self-reported efficacy in stroke care by 15 percent (P: 0.039, cOR: 1.15, CI: 1.01 – 1.31). Participants from medical work units had about 15 times higher odds of reporting high self-efficacy in stroke care than participants from the emergency unit (P: < 0.001, cOR: 14.6, CI: 4.18 – 50.6).

At multivariable analysis, age, duration at the institution, gender and work unit retained significant predictive effects on reported self-efficacy in stroke care, while duration of nursing practice, knowledge, attitude and essential stroke care practices maintained no significant predictive effect of reported self-efficacy. Controlling for all other variables, a unit (year) increase in age was significantly associated with a 34% increase in the odds of reported high self-efficacy (P: 0.016, cOR: 1.34, CI: 1.05 – 1.70), while a month increase in duration at the institution significantly increased the odds of reported high self-efficacy by 5 percent (P: 0.032, cOR: 1.05, CI: 1.00 – 1.10). Females compared to males had about 6 times more odds of reporting high self-efficacy in stroke care (P: 0.042, cOR: 5.88, CI: 1.06 – 32.3). Working in the medical and surgical unit compared to working in the emergency unit increased the odds of reporting high self-efficacy about 38 times (P: < 0.001, cOR: 38.4, CI: 6.59 – 22.4) and 20 times (P: 0.035, cOR: 20.4, CI: 1.23 – 33.8) respectively

Discussion
Demographic Characteristics of the Participants
In the current study, most (81%) participants were females, while 19% were males. Similarly, other studies among nurses

and midwives have reported a preponderance of females [9-13]. The observed preponderance of females could be explained by the Nursing and Midwifery Council of Zambia (NMCZ) regulation that requires schools of nursing to allocate 50% of school places exclusively to female candidates and another 20 % to be competed for by both males and females leaving only 30% of places to males exclusively [14]. This regulation therefore gives a predominantly feminine face to the nursing profession in Zambia. The average age of the participants in the current study was 28.5 years (5.9) giving the face of a relatively young nursing workforce in the health facility under study and this finding could explain why the average work experience in years for this sample of nurses and midwives was only 3 years (IQR, 2 – 7). The Greater number of young and less experienced nurses on the wards could be attributed to the mass recruitment of nursing staff which had been undertaken by the Zambian MoH in the few years preceding the current study [15].

Considering that Zambia is a Christian country as enshrined in her constitution, almost all (98.8%) of the participants were Christians with slightly over half (52.8%) of them being married. Further, this study revealed that, the majority (83.3%) of participants were registered nurses, and about three quarters 117 (74%) worked in medical wards. Similarly, Hisaka et al. (2021), reported that most (66.7%) of the participants were general certified nurses in stroke rehabilitation nursing. Another study reported that majority of the participants were registered nurses specialising in stroke (Lawrence et al., 2009). The Nursing and Midwifery Council of Zambia (NMCZ, Formerly, General Nursing Council of Zambia [GNCZ]) abolished the Enrolled Nurse (EN) training programme and introduced EN to Registered Nurse (RN) abridged (fast truck) training programme July 2018. Therefore, most ENs especially the young ones, have since converted to RN.

Performance of Essential Practices in Stroke Care

In the current study half (50.9%) of the participants reported never having performed essential practices in caring for patients with stroke while just under half (49.1%) of the participants reported having performed essential stroke care practices. A more profound examination of this phenomenon revealed that, slightly over a quarter of participants reported not performing the following essential practices: Continuous cardiac monitoring up to 72 hours or more for patients on Thrombolytic treatment and for 24 to 48h for patients not receiving Thrombolytics (33.8%), Administering rtPA in divided doses (34.0%), Using the Braden Scale in the prediction of stroke patients at high risk of developing pressure ulcers (36.1%), Performing a bedside swallow screen in the first 24 hours after stroke (27.6%). In a similar study (Hisaka et al., 2021), scores for actual nursing care practice were significantly lower than the awareness of the importance of nursing care for patients with acute stroke.

One of the essential stroke care practices that was reported as not performed by some nurses was performing of a bedside swallow screen in the first 24 hours after stroke which is critical for prevention of Aspiration Pneumonia. This finding could explain why a recent study at this facility reported a notable occurrence of Aspiration Pneumonia among stroke patients [16]. A study by Power et al (2018) highlighted the role of nurses in conducting dysphagia screening and implementing interventions such as modified diets, thickened fluids, and speech therapy referrals to reduce the risk of aspiration and pneumonia in stroke patients. It is therefore evident that there could be an urgent need for nurses at this facility to be trained in performing the bedside swallow screening test to help reduce the occurrence of aspiration pneumonia among Stroke Patients. The none performance of certain essential practices could also explain in part, the high mortality among stroke patients that was reported in a recent study of course taking cognizance of the fact that this association if at all present can only be established through more robust designs such as randomized controlled trials.

Self-efficacy for Stroke Care Among Nurses

High self-efficacy for stroke care was reported among nearly all participants in the current study. This finding suggests great potential for nurses at this facility to engage in stroke care as researchers have postulated that nurses with strong self-efficacy beliefs in their ability to administer thrombolytic therapy are more likely to adhere to time-sensitive guidelines and protocols leading to higher rates of timely and successful thrombolysis [17]. Additionally, nurses' self-efficacy has been reported to be positively associated with their ability to provide effective education to stroke patients and their families as was evident in a study by McCarthy et al. (2020) in which nurses with high self-efficacy were more confident in delivering comprehensive information about stroke prevention, management, and rehabilitation [18]. The high self-efficacy for stroke care among nurses at this facility is therefore a resource that can possibly be harnessed to enhance stroke care once coupled with training.

Despite the high overall score on self-efficacy for stroke care, there were a few components of stroke care in which participants reported low self-efficacy and notably, most of the aspects in which self-efficacy was low also recorded a low score on practice. These components included: Continuous cardiac monitoring (61.2%); withholding emergency administration of antihypertensive agents Administer rtPA in the right doses and frequency (55.1%); using the Braden Scale in the prediction of stroke patients at high risk of developing pressure ulcers (57.4%); and performing a bedside swallow screen (50.8%). It therefore remains that nurses at this teaching hospital might require a training package that will include performance of these essential practices in which both self-efficacy and performance were reported to be low. It must be noted that omission of just one essential practice such as performing the bed side swallow screening test can produce severe consequences such as aspiration pneumonia.

Factors Influencing the Performance of Essential Practices in Stroke Care

The current study revealed that age, duration of nursing practice, duration at the institution, gender, work unit, self-efficacy, attitude and knowledge had no significant influence on reported performance of stroke care practices among nurses and midwives.

However, various factors have been revealed in other studies. Brown and Smith (2019) reported that high nurse-to-patient ratios were associated with increased stress and reduced time available for individual patient care while Clark et al (2020) reported that smart monitoring systems and electronic health records contributed to more efficient data collection and time-

ly decision-making in patient care [19, 20]. Further, Age of the nurse might also have a positive effect on the performance of essential stroke care practices as older nurses and midwives are known to be the most skilled and productive employees. They have a wealth of life experience, superior communication skills, dedication and loyalty, take fewer sick days and are less inclined to consider working abroad [21].

While the current study reported no significant influence of duration of practice on the performance of stroke practices, a similar study showed a significantly higher score on practice in the group with 11–20 years of experience as a nurse compared to the group with 0–3 years of experience as a nurse and the group with 6–10 years of experience as a nurse. Generally, the actual practice of recognition of patient's physical change and preventing the worsening of acute stroke and related symptoms varied, depending on years of experience in acute phase stroke care with those that have 6 years plus experience performing better. Based on these findings from other studies, the role of experience in stroke care is evident heralding a need to retain the more experienced nurses in the clinical area to forster quality stroke care and mentor the younger nurses.

Factors Influencing Self Efficacy for Stroke Care Among Nurses and Midwives
In the current study, age, duration at the institution, gender, and work unit had significant predictive effects on reported self-efficacy in stroke care, while duration of nursing practice, knowledge, attitude and essential stroke care practices maintained no significant predictive effect of reported self-efficacy. Older nurses as well as those that had served longer at the institution reported higher odds of having high self-efficacy in stroke care. Similarly, a longitudinal study by Anderson and Davis (2019) demonstrated a positive correlation between years of experience and increased self-efficacy, suggesting that practical exposure to stroke cases enhances a nurse's confidence and ability to manage complex scenarios [22]. Findings of the current study therefore underscore the significance of retaining more experienced nurses in caring for patients with stroke as they may be more confident in providing care based on their vast experience. The aspect of longevity in stroke care could also explain why nurses that had stayed longer at the facility had higher self-efficacy. Repeated exposure to stroke patients and corresponding use of stroke care protocols over time might instill a sense of confidence in the nurses. Further augmenting the role of longevity on the job in enhancing self-efficacy among nurses, an earlier cross-sectional analysis by Johnson et al. (2020), had reported a synergistic effect, with older nurses who had extensive experience demonstrating the highest levels of self-efficacy [23].

Another notable finding in the current study was that females compared to males had about 6 times greater odds of reporting high self-efficacy in stroke care. Contrary to findings of the current study, Smith et al. (2018) found no significant gender differences in self-efficacy levels among nurses providing stroke care. Reasons for this discrepancy remain unclear although Brown and Johnson (2019) argued that societal expectations and gender roles may influence how male and female nurses perceive their self-efficacy in dealing with complex stroke cases [24]. The finding that females reported higher levels of self-efficacy do however support the Nursing and Midwifery Council of Zambia (NMCZ) regulation that demands more females to be recruited into schools of nursing as opposed to males. If females have greater self-efficacy for stroke care, then it remains advantageous to have more females in the profession caring for stroke patients.

It was also notable that working in the medical and surgical unit compared to working in the emergency unit increased the odds of reporting high self-efficacy. This finding could be attributed to the longer time that nurse in medical and surgical units possibly spend caring for patients with stroke relative to their counterparts in emergency units which serve largely as transit points for diagnosis and emergency care. It is thus evident that spending more time in the care of stroke patients could increase nurses' confidence in providing care. Findings suggests that nurse managers might have to exercise caution when transferring nurses from unit to unit to allow for those attending to stroke patients more time to acquire the requisite experience that might further enhance their self-efficacy for providing care.

Conclusion
Slightly over half of the nurses in the current study reported not performing essential stroke care practices. This heralds a need for in-house training, and for large scale studies that can investigate performance of essential stroke care practices using observational approaches. Further, the high levels of self-efficacy reported among most participants signals great potential for enhancing care if coupled with requisite training. An overarching need therefore remains for the development of practice protocols and guidelines that can be used to train nurses in the care of stroke patients.

Competing Interests
The authors declare no conflict of interest

Author's Contributions
PKM and MCB conceptualized the project, PKM further wrote the Background information, refined the protocol and drafted the first version of the manuscript. MMK and EMK wrote the methodology section, VMK wrote the statement of the problem and justification of the study, PDCP and PM contributed in Proof reading, re-alignment of information for the article while FC, MS, CK and HS conducted the literature review.

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