Palestinian Medical and Pharmaceutical Journal

Knowledge, Attitude and Practice of Emergency Nurses Regarding the Early Management of Patients with Acute Ischemic Stroke in Palestine

Rebhi Bsharat[1,*], Sobhi Abu Farha[1], Roaa Halabi[1], Hussein Saada[1], Aya Abbas[1], Ahmed Dannoun[1]

Received: 25th Sep. 2024, Accepted: 16th Feb. 2025, Published: XXxx XX, 202X, DOI: https://doi.org/10.xxxx

Accepted Manuscript, In press

Abstract: Acute ischemic stroke (AIS) requires prompt intervention to minimize damage, Emergency nurses play an important role in the early management of acute ischemic stroke. Therefore, it is necessary to investigate the knowledge, attitudes, and practice of emergency nurses in Palestine regarding the early management of acute ischemic stroke. Descriptive, cross-sectional study enrolled 270 emergency nurses in 26 hospitals in Palestine between February and April 2024. Knowledge, attitude and practice were evaluated, data collected by self-administrated questionnaire, and inferential analysis were used to analyze the data. This study included 270 nurses, Men slightly outnumber women, representing 51.9% of the participants. The majority of the participants are young adults, with 60.0% in the 20-29 age range, most participants are bachelor's degree holders (71.1%) with less than five years of experience (53.3%). We found the of knowledge level shows that 70.60% of the responses were correct, demonstrating a majority of the nurses have a good understanding of the protocols and procedures in managing acute ischemic stroke. Attitude level shows that 85.40% of the responses were positive attitude. Practice level is shows that 82% of the responses were in good practice. This study shown that majority of the nurses have a good understanding of the protocols and procedures in managing acute ischemic stroke 70.60% of the responses, Positive attitude toward various aspects of AIS management and good practice in the management of AIS.

Keywords: Emergency department, Acute ischemic stroke, Knowledge, Attitudes, Practice, Nursing Management.

Introduction

Approximately 6 million people die from stroke every year, and acute cerebral infarction (ACI) is a leading cause of mortality and long-term impairment in adults worldwide [1-3]. According to estimates, cardiovascular disorders would be the cause of about 25 million fatalities in 2020 [4]. Consequently, one out of every three fatalities would result from CVDs. In Palestine, cardiovascular disease is acknowledged as the leading cause of death. The West Bank (WB) has a greater incidence (57%), while the Gaza Strip (GS) has a 40% incidence [9]. The mortality rate from ACI is roughly 105 per 100,000 person-years, while stroke is a significant cause of morbidity and mortality among Palestinians. According to reports, CVD accounted for 29.5% of all deaths in 2014, while CBVD was the third most common cause, accounting for 11% of all deaths [4, 5]. The average age of the patients was 69.09 ± 10.9 years [6]. Ischemic stroke due to arterial occlusion accounts for about 70% of all ACI instances, with hemorrhagic stroke accounting for the remaining percentage. Interestingly, there is a correlation between stroke and an in-hospital death rate [7].

Acute ischemic stroke (AIS), a neurological emergency caused by large-vessel occlusion (LVO), is characterized by an abrupt stop in blood flow to specific brain regions, which causes a rapid and progressive loss of neurons [8]. Although prompt and efficient treatment is required to reduce morbidity and mortality, patients' quality of life and prognosis can be greatly enhanced [9]. Nonetheless, AIS is treated in a number of departments, including neurology, cerebrovascular surgery, emergency room, imaging department, and interventional operating room [10].

Stroke is the third most common cause of disability worldwide and the most prevalent cerebrovascular disease. The emergency room is where the majority of patients with acute ischemic stroke (AIS) are initially assessed. When it comes to recognizing stroke patients and setting priorities for their care, emergency nurses are essential [11]. Coronary artery disease was the most prevalent ailment (8.30%), followed by stroke occurrences (3.00%). Obesity was one of the linked risk variables (47.80%) [12]. The clinical presentation—which may include acute loss of balance or coordination, visual abnormalities, facial weakness or asymmetry, arm or limb weakness, and difficulties speaking or slurring—is used to make the diagnosis of stroke [13].

Research has indicated that the thrombolysis team can effectively increase intravenous thrombolysis rates and decrease intravenous thrombolysis door to needle time (DNT) by providing trained nurses. Throughout the prehospital, acute, and posthospital phases of care, the nurse practitioner (NP) may have a major influence on patient outcomes. As a result, the nurses require ongoing stroke education, which can alter their perspectives on providing complete care for stroke patients [14].

According to the guidelines, patients who have a suspected stroke should be evaluated within ten minutes of arriving at the emergency room. The clinical evaluations should include prompt triage, taking a history, performing a neurologic examination, administering a stroke screening tool, and performing neuroimaging, as previously stated by Herpich and Rincon (2020). The two primary methods for treating stroke are

1 Faculty of Nursing, Modern College University, Ramallah, Palestine.
*Corresponding author: rebhi.bsharat@muc.edu.ps

endovascular thrombectomy and intravenous thrombolysis (using substances like tissue plasminogen activator) [15]. However, intravenous thrombolysis only lessens disability if given within 4.5 hours of symptom onset, whereas endovascular thrombectomy only exhibits clinical benefits when carried out within 6.

Materials and Methods

Descriptive, quantitative and cross-sectional design with anonymous self-administered questionnaire about (AIS) knowledge, attitude and practice were conducted between emergency nurses at hospitals and emergency centers in West Bank and East Jerusalem in Palestine.

Study Setting and Population

Ten hospitals and seven emergency centers were chosen randomly to be part of the study. Three were governmental hospitals, six were private hospitals at Palestine (West bank and East Jerusalem). The study was conducted for three months and began in February 2024 until end of April. The target population for this study include of all emergency nurses working various healthcare setting (governmental hospitals, private hospitals and emergency centers) in Palestine (West bank and East Jerusalem). The population include 900 emergency nurses.

Sampling and Sample Size

Convenient sampling method which is non-probability used to obtain the required sample size. The sample included 270 employed as emergency nurses in Governmental Hospitals, private hospitals and emergency centers. The sample size was calculated based on population size using sample size calculator (statistical power), the analysis considered key factors, including the desire level of confidence (95%), margin of error (%5). by using this approach, we ensured that the sample size was sufficient to detect significant differences or relationship within the population.

Inclusion & Exclusion Criteria

Governmental Hospitals, private hospitals and emergency centers in Palestine and east Jerusalem, Registered nurses work in emergency departments. Not fully qualified nurses (nursing students, intern nurses), other medical staff, refused to participate in the study

Data Collection Tool

The 2018 American Heart Association/American Stroke Association (AHA/ASA) Guidelines for the Early Management of Patients with Acute Ischemic Stroke served as the basis for the questionnaire's construction. The survey was created in Arabic and comprised 44 questions covering four areas: demographics (9 items), knowledge (22 items), attitudes (10 items), and practice (4 items). It was based on the 2018 AHA/ASA Guidelines for the Early Management of Patients with Acute Ischemic Stroke. While attitudes and practice items were graded on a 5-point Likert's scale, knowledge questions were scored with one point for accurate responses. Google Forms was used to distribute the survey, and in order to guarantee accuracy, only one submission per IP address was allowed. Once finished, the study team exported the data and checked it for accuracy and completeness [17, 18].

Reliability and Validity of Data Collection Tool

Both the previously approved questionnaire that assessed healthcare professionals' knowledge of acute stroke management and the one that was translated into Arabic by four experts [19]. After four experts with senior professional titles reviewed and edited the initial form of the questionnaire, 27 emergency nurses which is 10% of sample size were given the final version as a pretest. The questionnaire exhibited high-to-excellent reliability, according to an analysis of the pretest findings. The Cronbach's alpha of the knowledge items (22 items) 0.70, The Cronbach's alpha of the attitude items (9 items) 0.86, The Cronbach's alpha of the practice items (4items) 0.70.

Data Analysis

Version (27), of the Statistical Package for Social Sciences (SPSS), was used to examine the data that was gathered. After entering the data, it was double-checked for errors or outliers. Descriptive and inferential statistics were used to analyze the data. In terms of descriptive statistics, the study variables were described using frequency, percentages, mean score, and Standard Deviation (SD). To evaluate the differences between variables, one-way ANOVA and the independent t-test were used as inferential statistics.

Ethical Considerations

This study was approved by taking permission from the Modern University Ethics Committee Ref: muc002\2023 approved on September, 25 2023. Informed consent was obtained from the patients before they participated in the study. Anonymity, confidentiality, non-maleficence, and beneficence were ensured. Approval from MOH was obtained prior to the start of the study. The data obtained was fully encrypted. Before conducting the study, patients were informed about the purpose of the study. Also, they were told that they had the autonomy to participate in the study and were respected if they wanted to or abstained.

Results and Discussion

With 51.90% of the 270 healthcare workers in the survey being male and 48.10% being female, Table (1) presents the demographics of the workers. With 60.00% of workers in their 20s and 30s, 28.50% in their 30s, and 41.5% in their 40s, the workforce is comparatively young. The majority of participants (71.10%) are bachelor's degree holders, followed by master's (10.00%) and PhD (5.00%). More than half (53.30%) have worked in emergency departments for less than five years, and 73.00% have worked there for less than five years. With 52.20 % working at government hospitals, emergency centers and private hospitals come in second and third, respectively. For professional development, 37.40% sometimes engage in active learning on acute stroke care, 35.90% frequently, and 26.70% occasionally. Most are certified in Basic Life Support (87.00%) and Advanced Cardiac Life Support (67.40%).

Table (2) shows the knowledge level of emergency nurses in managing acute ischemic stroke. It reveals that 70.60% of the responses were correct, indicating that most nurses have a solid grasp of the necessary protocols and procedures. However, 29.40% of the responses were incorrect, suggesting that nearly a third of the nurses could benefit from further training or resources to improve their knowledge in this crucial area of emergency care.

Table (1): Demographic Variables of the Participants (n=270)

Item		n	%
Gender	Male	140	51.90%
	Female	130	48.10%
Age groups	20-29 years old	162	60.00%
	30-39 years old	77	28.50%
	40-49 years old	31	11.50%
Level of education	Diploma	47	17.40%
	Bachelor Degree	192	71.10%
	Master Degree	27	10.00%
	PhD	4	1.50%
Years of experience	<5 years	144	53.30%
	5-10 years	69	25.60%
	>10 years	57	21.10%
Years of experience in Emergency Department	<5 years	197	73.00%
	5-10 years	58	21.50%
	>10 years	15	5.60%
Place of work	Governmental Hospital	141	52.20%
	Private hospital	69	25.60%
	Emergency center	60	22.20%
Repetition of active learning related to acute stroke	Sometimes	101	37.40%
	From time to time	72	26.70%
	Frequently	97	35.90%
Are you a BLS provider?	Yes	235	87.00%
	No	35	13.00%
Are you an ACLS provider?	Yes	182	67.40%
	No	88	32.60%

N: sample size %: Perscentage

Table (2): Knowledge Level toward the Emergency Nurses Regarding the Early Management of Patients with Acute Ischemic Stroke

Item	Correct Answer		Incorrect Answer	
	n	%	n	%
Familiarity with the FAST principles (face arm speech time) for patients with AIS.(True)	251	93.00%	19	7.00%
Impairment of consciousness may be a sign of AIS.(True)	254	94.10%	16	5.90%
High or low blood sugar may cause symptoms similar to AIS.(True)	246	91.10%	24	8.90%
Patients with AIS may develop visual impairment.(True)	249	92.20%	21	7.80%
AIS can manifest as limb numbness.(True)	239	88.50%	31	11.50%
Unsteady gait may be one of the signs of AIS.(True)	255	94.40%	15	5.60%
AIS can manifest as a decreased level of consciousness (True).	260	96.30%	10	3.70%
Assessment of pupil reactivity and head CT should be performed immediately in patients with suspected AIS.(True)	255	94.40%	15	5.60%
High blood pressure should be normalized in patients with AIS (false).	28	10.40%	242	89.60%
All patients with AIS should undergo CT as a first-line investigation.(True)	248	91.90%	22	8.10%
The earlier the treatment, the better the treatment effect in patients with AIS.(True)	257	95.20%	13	4.80%
A goal of AIS management is that at least 50% of patients who require intravenous thrombolysis should receive it within 90 minutes of admission (false).	25	9.30%	245	90.70%
Treatment of AIS includes intravenous thrombolytic therapy and endovascular interventional therapy.(True)	241	89.30%	29	10.70%
Nurses must fully assess bleeding risk in patients with AIS before intravenous thrombolysis (false).	24	8.90%	246	91.10%
All patients with AIS must undergo 12-lead electrocardiography before thrombolysis (false).	55	20.40%	215	79.60%
Patients with AIS aged >80 years are not eligible for thrombolytic therapy (false).	95	35.20%	175	64.80%
Intravenous thrombolytic therapy and endovascular interventional therapy can only be carried out in patients with AIS within the treatment window.(True)	198	73.30%	72	26.70%
Assessment of swallowing function should be performed as early as possible in patients with AIS.(True)	226	83.70%	44	16.30%
Patients with AIS with malnutrition or at risk of malnutrition should be given early nutritional support.(True)	255	94.40%	15	5.60%
Active measures to prevent venous thrombosis of the lower extremities should be implemented in bedridden patients with AIS who do not have contraindications.(True)	245	90.70%	25	9.30%
It is recommended that indwelling urinary catheters should be used routinely in patients with AIS (false).	53	19.60%	217	80.40%
Patients should not undergo exercise within 24 hours of AIS.(True)	235	87.00%	35	13.00%
Average Answers (22 items)	70.60%		29.40%	

N: sample size %: Perscentage

Table (3) shows that 85.40% of emergency nurses have a positive attitude toward managing acute ischemic stroke (AIS), with an overall mean score of 4.27 (SD = 0.513). The highest mean score, 4.44 (SD = 0.707), is for the belief that nurses should have knowledge about early AIS management, indicating a strong emphasis on professional knowledge. Item 1, reflecting a strong interest in gaining AIS knowledge, follows closely with a mean of 4.39 (SD = 0.712). The lowest score is for Item 3, with a mean of 3.92 (SD = 0.890), suggesting that while attitudes are positive, there is an acknowledgment that current knowledge may not fully meet clinical needs.

Table (3): Attitude Level, Means Score for Each Item toward Attitude (n=270)

Item	M	SD	Status
Interest in knowledge about the early management of AIS.	4.39	0.712	Positive
Nurses should have knowledge about the early management of AIS.	4.44	0.707	Positive
Existing level of knowledge regarding the early management of AIS meets the clinical needs.	3.92	0.890	Positive
Formal training in the early management of AIS by nurses can guide clinical work.	4.28	0.724	Positive
Nurses play an important role in the early management of AIS.	4.35	0.756	Positive
It is necessary to have a multidisciplinary emergency stroke team that includes doctors, nurses, and laboratory/imaging staff.	4.34	0.713	Positive
Capable of performing the nursing duties required for the early management of AIS.	4.05	0.766	Positive
The early management of AIS is very important.	4.38	0.721	Positive
Knowledge and guidance regarding the early management of AIS should be provided to patients with AIS and their families.	4.32	0.709	Positive
Overall Mean score (9 items)	4.27	0.513	Positive

Mean (M) score over 5; Cut of point= 3. Higher mean score means positive attitude

Table (4): Practice Level, Means Score for Each Item toward Practice (n=270)

Item	Mean	SD	Status
How often is antihypertensive therapy given before thrombolytic therapy in patients with AIS under my care	4.081	0.762	Good practice
How often is blood glucose measured before thrombolytic therapy in patients with AIS under my care	4.14	0.763	Good practice
Placement of an indwelling urinary catheter is routinely done in patients with AIS under my care	4.00	0.887	Good practice
How often is early nutritional support given to patients with AIS under my care who have malnutrition or are at risk of malnutrition	4.18	0.750	Good practice
Overall Mean score (4 items)	4.10	0.556	Good practice

Mean score over 5; Cut of point= 3. Higher mean score means good practice

Table (5): Difference between Demographic Variables in Terms of both Knowledge, Attitude and Practice Scores Regarding the Early Management of Patients with Acute Ischemic Stroke

Item		n	Knowledge			Attitude			Practice		
			Mean	SD	P-value	Mean	SD	P-value	Mean	SD	P-value
Gender	Male	140	15.70	1.34	0.054	4.27	.53	0.841	4.19	0.53	.004*
	Female	130	15.35	1.56		4.28	.49		4.00	0.56	
Age groups	20-29 y	162	15.45	1.51	0.448	4.32	.52	0.217	4.10	0.58	0.995
	30-39 y	77	15.58	1.29		4.21	.51		4.10	0.52	
	40-49 y	31	15.80	1.62		4.21	.44		4.11	0.45	
Level of education	Diploma	47	15.48	1.30	0.800	4.20	.47	0.382	4.10	0.59	0.009*
	Bachelor Degree	192	15.52	1.49		4.27	.52		4.0z	0.53	
	Master Degree	27	15.55	1.64		4.41	.50		4.42	0.57	
	PhD	4	16.25	.50		4.38	.49		4.37	0.47	
Years of experience	<5 years	144	15.40	1.56	0.218	4.27	.52	0.978	4.05	0.58	0.301
	5-10 years	69	15.56	1.18		4.27	.53		4.17	0.53	
	>10 years	57	15.80	1.49		4.29	.45		4.13	0.50	
Years of experience in Emergency Department	<5 years	197	15.52	1.49	0.536	4.27	.51	0.313	4.08	0.55	0.557
	5-10 years	58	15.46	1.47		4.34	.49		4.10	0.55	
	>10 years	15	15.93	.88		4.11	.56		4.18	0.56	
Place of work	Governmental Hospital	141	15.48	1.49	0.725	4.25	.51	0.615	4.14	0.55	0.471
	Private hospital	69	15.50	1.30		4.28	.53		4.05	0.53	
	Emergency center	60	15.66	1.52		4.33	.47		4.07	0.58	
Repetition of active learning related to acute stroke	Sometimes	101	15.51	1.59	0.678	4.26	.49	0.095	3.99	0.55	0.025*
	From time to time	72	15.43	1.36		4.18	.49		4.11	0.50	
	Frequently	97	15.62	1.40		4.36	.53		4.21	.58	
Are you a BLS provider?	Yes	235	15.57	1.47	0.188	4.29	.52	0.194	4.11	0.55	0.534
	No	35	15.22	1.35		4.17	.43		4.05	0.58	
Are you an ACLS provider?	Yes	182	15.63	1.27	0.093	4.30	.50	0.231	4.15	0.55	0.023*
	No	88	15.31	1.78		4.22	.51		3.99	0.54	

*Significant at p=<0.05; Independent t test and One-Way ANOVA

Table (4) shows that the combined mean score across all four items is 4.10 (SD = 0.556), reflecting a consistent "Good practice" level in the early management of AIS among the surveyed nurses.The relatively low standard deviation suggests that these practices are uniformly applied among the respondents. Table depicts the practice level of emergency nurses regarding the early management of patients with acute ischemic stroke. It shows that 82.00% of the responses were in good practice toward managing acute ischemic stroke. Conversely, 18.00% of the responses were poor practice.

As shown in Table (5), the analysis reveals significant differences in stroke care practices among the participants based on gender, education level, learning frequency, and ACLS provider status. Male participants show higher practice scores

(mean = 4.19) compared to females (mean = 4.00) (p = .004). Higher education levels, particularly holding a PhD, correlate with better practice scores (mean = 4.37) (p = .009). Frequent active learning is associated with improved practices (mean = 4.21) (p = .025), and ACLS providers also exhibit higher practice scores (mean = 4.15) compared to non-providers (mean = 3.99) (p = .023). These findings suggest that gender, education, active learning, and ACLS certification play crucial roles in enhancing the practical application of stroke care techniques. However, no significant differences were found between all demographic variables in terms of both knowledge and attitude (p=>0.05).

DISCUSSION

The findings were organized into five main sections: the first covered the demographic details of the emergency nurses in the study; the second focused on their knowledge and attitudes toward early management of acute ischemic stroke; the third examined their practices in managing acute ischemic stroke; the fourth further explored their management practices; and the fifth analyzed how demographic factors influenced their knowledge, attitude, and practice scores in early stroke management.

Demographic Data of the Emergency Nurses under the Study

Regarding the demographic characteristics of the studied nurses in this study, the result of the current study revealed that of the 270 participants, this result was almost consistent with Farideh et al. In 2021, the participants were 285. Men slightly outnumber women, representing 51.9% of the participants, which is inconsistent with Farideh et al. (2021), where the majority were women [20]. The majority of the participants are young adults, with 60.0% in the 20–29 age range. This result was also found in a study by Nagep et al. (2020), which revealed that there were the most nurses (85.3%) within the age group (18–< 30 years) [20]. The vast majority hold a bachelor's degree (71.1%), as in Farideh et al.'s (2021) undergraduate degree (87.4%). More than half of the participants have less than five years of experience (53.3%). the experience within emergency departments, a significant 73.0% have less than five years. Mahdy et al. (2016) reported that of the years of experience in the nursing field, 44% had less than 5 years [22], and Al-Abidi and Mansour (2022). Regarding years of experience in the nursing field, 41.67% of the study sample have (1-3) years (23). Also, years of experience in the current area (88.33%) have [1-3] years' experience in the current area. The workplaces of the participants are predominantly governmental hospitals (52.2%), with 87.0% being Basic Life Support (BLS) providers. Additionally, a substantial 67.4% are also providers of Advanced Cardiac Life Support (ACLS).

Emergency Nurses' Knowledge, Attitude and Practice Regarding the Early Management of Patient with Acute Ischemic Stroke

A 70.60% of emergency nurses' responses were correct when asked about their knowledge of the early management of patients with acute ischemic stroke, indicating that most of them are well-versed in the protocols and procedures involved in treating acute ischemic stroke. On the other hand, nearly a third of the nurses may benefit from more training or resources to improve their understanding of this crucial area of emergency care, as seen by the 29.40% of wrong responses. Our study confirmed that emergency nurses knew a moderate amount about the early management of patients with AIS, which was supported by research conducted in Beijing, China [24].

The proportion of nurses giving correct answers to each of the 22 questions in the knowledge dimension ranged from 0.35% to 97.87% (24). Additionally, this outcome was consistent with our findings by Adika, et al (2012), who reported that almost one-third (32%) of nurses had excellent knowledge, while less than one-third (29%) had insufficient knowledge [25]. The management of elderly stroke patients was something that the remaining 39% knew a fair amount about. A 2009 study showed that reading pertinent stroke literature and taking part in continuing medical education (CME) activities were linked to higher stroke knowledge by up to 45% and 15%, respectively, among U.S. nurses, indicating the influence of prior stroke education or training on higher levels of stroke knowledge [26].

Emergency Nurses' Attitude Regarding the Early Management of Patient with Acute Ischemic Stroke

The Attitude level of emergency nurses regarding the early management of patients with acute ischemic stroke shows that 85.40% of the responses were positive attitudes toward managing acute ischemic stroke. Conversely, 14.60% of the responses were negative attitudes. The study indicated that emergency nurses had a positive attitude regarding the early management of acute ischemic stroke. A study found in Beijing, China, supported our finding that emergency nurses have a positive attitude regarding the early management of acute ischemic stroke [24]. Our result consistent with other studies that were conducted in Ardabil City in 2021 and showed that knowledge of stroke warning signs and attitude toward stroke care were stronger predictors of acute stroke management [27]. During the study's intervention periods—before, immediately after, and two months after the implementation—Naga (2021) reported that the competency-based program enhanced the nurses' knowledge, skills, and attitudes [28].

Emergency Nurses' Practice Regarding the Early Management of Patient with Acute Ischemic Stroke

The Practice level of emergency nurses regarding the early management of patients with acute ischemic stroke shows that 82% of the responses were in good practice toward managing acute ischemic stroke. Conversely, 18% of the responses were poor practice. Our result is consistent with research made in China, who found that the respondents had a comparatively high skill/practice score [24]. Our study on the line with Hisaka et al. (2021) nurses in Japan who found that awareness and actual practice of recognizing patients' physical changes were high [29]. This may be because implementing the ischemic stroke nursing management protocol improves the nurses' knowledge and practices [30].

Difference between Demographic Variables In Terms Of both Knowledge, Attitude and Practice Scores Regarding the Early Management of Patients with Acute Ischemic Stroke

Practice Scores by Gender: There is a significant difference in practice scores between male (mean = 4.19, SD = .53) and female (mean = 4.00, SD = 0.56) participants (p = .004). This suggests that male participants may engage in or apply stroke care practices more effectively or frequently than female participants in this sample. This result consistent with study Jiyad and Muhammed (2022) where they reported that there significant differences in the quality of nursing care with regard nurses who are male and those who are female [31]. Level of Education and Practice: Participants with a diploma in education have significantly different practice scores (mean = 4.10, SD = .59) compared to those with higher degrees, with PhD holders showing the highest practice scores (mean = 4.37, SD = .47) (p = .009). This could indicate that higher educational attainment is associated with better application of knowledge in stroke care, potentially due to deeper or more specialized knowledge. This finding is consistent with that of Jiyad and Muhammad (2022), who found that nurses' educational backgrounds significantly influenced the quality of nursing care (p=0.000). Bachelor's degree-holding nurses provided much higher-quality nursing care [31].

Repetition of Active Learning and Practice: The frequency of engaging in active learning related to acute stroke has a

significant impact on practice scores. Those who frequently engage in active learning have higher practice scores (mean = 4.21, SD = .58) compared to those who engage sometimes (mean = 3.99, SD = .55) (p = .025). This suggests that regular, active engagement in learning activities may enhance the practical application of stroke care techniques. These findings are inconsistent with Du et al. (2024) that there is no significant difference between the frequency of engaging in active learning in term of practice scores regarding the early management of patients with acute ischemic stroke [24].

Advanced Cardiac Life Support (ACLS) Provider Status and Practice: Being an (ACLS) provider is associated with significantly higher practice scores (mean = 4.15, SD = .55) compared to non-providers (mean = 3.99, SD = .54) (p = .023). This finding underscores the value of ACLS training in improving practical skills related to stroke care (Sodhi, Singla, & Shrivastava, 2011). Our result consistent with Rajamani and Dinagaran (2021) where they reported that The ACLS training program improved the final-year B. Sc. (N) students' proficiency with ACLS [32].

Limitations

There are several restrictions on this study. First, the study could not have had enough statistical power to identify certain true differences between groups because the sample size was small. Second, it's unclear if the results of this multicenter study apply to all of Palestine because it only covered emergency nurses in Palestine. Third, even though the KAP questionnaire was created using tried-and-true methods, there might be a limit to how well it can gauge opinions about the early treatment of AIS. Fourth, the effectiveness of education or training programs in raising questionnaire scores was not examined in this study. Furthermore. Subsequent research endeavors may contemplate alternative approaches to better accurately evaluate knowledge, such as amalgamating dichotomous and ordinal responses. Despite being statistically significant, the sample size of 270 emergency nurses could not be representative of all emergency nurses in Palestine. This restricts the findings' applicability to a wider setting.

Conclusion

The results showed that although the majority of emergency nurses are proficient in treating acute ischemic stroke (AIS), almost one-third do not know enough, which may have an effect on patient outcomes. While most people have a favorable attitude about AIS management, more education is required to properly meet clinical expectations. To raise awareness and improve emergency nurses' ability to handle strokes early on, more comprehensive education and training programs are required. The study suggests starting in-service training programs on evidence-based techniques for managing these cases and creating a complete booklet with guidelines for emergency nurse management of patients with ischemic stroke, Maintaining current knowledge, attitudes, and practices among emergency nurses requires ongoing seminars and effective training programs. The results might only apply to the Palestinian context and not to other areas or healthcare systems with differing socioeconomic, cultural, and healthcare resource characteristics. Therefore, more research is advised.

Ethics approval and consent to participate

This study was approved by taking permission from the Modern University Ethics Committee Ref:muc002\2023 approved on September, 25 2023.

Consent for publication

The authors agree to the publication of this article in this journal.

Availability of data and materials

The data and materials supporting the findings of this study are available upon reasonable request from the corresponding author.

Author's contribution

In the conception, study design, execution, data acquisition, analysis, and interpretation of the work reported, or in all of these areas, each author contributed significantly; they all participated in the article's drafting, revision, or critical review; they all agreed on the journal to which the article will be submitted; they reviewed and approved all iterations of the article before submission, during revision, the final version that was accepted for publication, and any significant changes made during the proofing stage; and they all agreed to accept responsibility and accountability for the article's contents.

Funding

Not applicable

Conflicts of interest

The authors declare that there is no conflict of interest regarding the publication of this article

Acknowledgements

The authors express their gratitude to all of the participating patients as well as the experts from the facilities that helped with data collecting.

References

1) GBD 2017 Causes of Death Collaborators. Global, regional, and national age-sex-specific mortality for 282 causes of death in 195 countries and territories, 1980-2017: a systematic analysis for the Global Burden of Disease Study 2017. Lancet. 2018; 392 (10159):1736-1788. https:// doi.org/10.1016/s0140-6736 (18)32203-7.
2) Phipps MS, Cronin CA. Management of acute ischemic stroke. BMJ. 2020; 368:l6983. https://doi.org/10.1136/bmj.l6983.
3) Virani SS, Alonso A, Benjamin EJ, et al. Heart disease and stroke Statistics-2020 update: a report from the American Heart Association. Circulation. 2020;141(9):e139-e596. https://doi.org/10.1161/cir.0000000000000757.
4) Palestinian health information Center (PHIC). “Palestinian annul health report, general department of planning and health policies” Ministry of Health (2018).
5) Annual Health Report, Palestine 2022- MOH, www https://site.moh.ps.
6) Sweileh, W. M., Sawalha, A. F., Al-Aqad, S. M., Sa'ed, H. Z., & Al-Jabi, S. W. (2008). The epidemiology of stroke in northern palestine:

a 1-year, hospital-based study. Journal of Stroke and Cerebrovascular Diseases, 17(6), 406-411.

7) Campbell BCV, De Silva DA, Macleod MR, et al. Ischaemic stroke. Nat Rev Dis Primers. 2019;5(1):70. https://doi.org/10.1038/s41572-019-0118-8.

8) Desai, S. M., Rocha, M., Jovin, T. G., & Jadhav, A. P. (2019). High variability in neuronal loss: time is brain, requantified. Stroke, 50(1), 34-37.

9) Wang, L., Liu, J., Yang, Y., Peng, B., & Wang, Y. (2019). The prevention and treatment of stroke still face huge challenges-brief report on stroke prevention and treatment in China, 2018. Chin Circ J, 34(2), 105-119.

10) Li, D., Zhang, H., Lu, X., Zhang, L., & Liu, J. (2022). Practice of integrated treatment process for acute ischaemic stroke in hospital coordinated by emergency stroke nurses. Nursing open, 9(1), 586-592.

11) Haki, C., & Demirci, H. (2022). Emergency staff knowledge, attitude and behaviors in emergency treatment of stroke. JMS SKIMS, 25(1), 17-24.

12) Shahwan, A. J. (2019). Epidemiology of Cardiovascular disease and associated risk factors in Gaza Strip-Palestine. Université de Limoges,

13) Du, Y., Xue, N., Liang, J., & Deng, Y. (2024). Knowledge, Attitude, Skill, and Practice of Emergency Nurses Regarding the Early Management of Patients With Acute Ischemic Stroke in Beijing. Journal of Emergency Nursing, 50(1), 95-105.

14) Kolankoh, F. A., Mozaffari, N., Dashti-Kalantar, R., & Mohammadi, M. A. (2023). 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 Journal of Neurology, 29(1), 052-059.

15) Herpich, F., & Rincon, F. (2020). Management of Acute Ischemic Stroke. Critical Care Medicine, 48(11), 1654-1663. doi:10.1097/ccm.0000000000004597.

16) Andrade C, Menon V, Ameen S, Kumar Praharaj S. Designing and conducting knowledge, attitude, and practice surveys in psychiatry: practical guidance. Indian J Psychol Med. 2020;42(5):478-481. https://doi.org/ 10.1177/0253717620946111

17) Powers, W. J., Rabinstein, A. A., Ackerson, T., Adeoye, O. M., Bambakidis, N. C., Becker, K., Hoh, B. (2018). 2018 guidelines for the early management of patients with acute ischemic stroke: a guideline for healthcare professionals from the American Heart Association/American Stroke Association. stroke, 49(3), e46-e99.

18) Wang, G., Fang, B., Yu, X., & Li, Z. (2018). Interpretation of 2018 guidelines for the early management of patients with acute ischemic stroke. Zhonghua Wei Zhong Bing Ji Jiu Yi Xue, 30(4), 289-295.

19) yang Sim, C., Zaidi, W. A. W., Shah, S. A., Yahya, W. N. N. W., & jan Tan, H. (2021). Knowledge of acute stroke management among healthcare professionals: development and validation of acute stroke management questionnaire (ASMaQ). Journal of Stroke and Cerebrovascular Diseases, 30(1), 10542.

20) Farideh et al. (2021),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. Türk Nöroloji Dergisi - 2023;29(1):52-59, Issue: 2023, Volume 29 - Issue 1, **Page:** 052-059, **DOI:** 10.4274/tnd.2023.30633.

21) Nagep, N. M., Mohammed, S. A., & Amr, E. F. (2021). Assessment of Nurses' Performance Regarding Care for Elderly Stroke Patients. NILES journal for Geriatric and Gerontology, 4(2), 301-317.

22) Mahdy, N. E., Mohamed, Y. M., & Nagm, L. M. A. (2016). Positioning and Early Mobilization: Effect of Educational Guidelines on Nurses' performance and Stroke Patients' Outcome. Journal of American Science, 12(8), 131-146.

23) Al-Abidi, H., & Mansour, K. (2022). Nurses Knowledge and Practice Concerning Nursing Management for Patients with Stroke. Kufa Journal for Nursing Sciences, 12(1).

24) Yue Du, et al. (2024), Knowledge, Attitude, Skill, and Practice of Emergency Nurses Regarding the Early Management of Patients With Acute Ischemic Stroke in Beijing, published online October 11, 2023, DOI: 10.1016/j.jen.2023.08.009 , Emergency Nurses Association. Published by Elsevier Inc. All rights reserved. Volume 50, Issue 1, January 2024, Pages 95-105.

25) Adika, V.O., Ezonbodor, R.E., P.P.K.Joffa, .., Apiyanteid, F.A., & Zuokemefa, B. (2012). Knowledge and Behaviour of Nurses Towards Care of Elderly Stroke Patients in Bayelsa State, Nigeria. *International Journal of Tropical Medicine, 7*, 74-79..

26) Harper, J. P. (2007). Emergency nurses' knowledge of evidence-based ischemic stroke care: a pilot study. Journal of emergency nursing, 33(3), 202-207.

27) Kolankoh, F. A., Mozaffari, N., Dashti-Kalantar, R., Mohammadi, M. A., & Mohammadi, M. A. The Relationship Between Knowledge of Evidence-based Care and Attitude Toward Stroke Care with Acute Stroke Management Among Emergency Nurses and EMS Personnel in Ardabil City in 2021, Turk Noroloji Derg. 2023, 29, 52–59.20. \

28) Naga, M., Bedier, N., Salem, M., Ahmed, H., & Elhfnawy, A. (2021). Effect of Competency Based Program on Nurses' Knowledge, Skills and Attitude toward the Care of Patients with Stroke. *Alexandria Scientific Nursing Journal*, *23*(2), 10-21. doi: 10.21608/asalexu.2021.219098.

29) Hisaka, Y., Ito, H., Yasuhara, Y., Takase, K., Tanioka, T., & Locsin, R. (2021). Nurses' awareness and actual nursing practice situation of stroke care in acute stroke units: a Japanese cross-sectional web-based questionnaire survey. International journal of environmental research and public health, 18(23), 12800.

30) Abdelhady, S. R., Mostafa, M., Kandeel, N. A., & Ali, W. G. (2022). The Effect of Implementing Ischemic Stroke Nursing Management Protocol on Critical Care Nurses' Knowledge and Practices. Mansoura Nursing Journal, 9(1), 223-233.

31) Jiyad, O. S., & Muhammed, T. R. (2022). Evaluation of Quality of Nursing Care Provided to Stroke Patients. RES MILITARIS, 12(2), 3572-3580.

32) Sodhi, K., Singla, M. K., & Shrivastava, A. (2011). Impact of advanced cardiac life support training program on the outcome of cardiopulmonary resuscitation in a tertiary care hospital. Indian journal of critical care medicine: peer-reviewed, official publication of Indian Society of Critical Care Medicine, 15(4), 209.1.