



Effectiveness of health education interventions on knowledge of stroke prevention among outpatient hypertensive patients at Ha Dong general Hospital

Nguyen Thi Thanh Nga¹, Truong Tuan Anh², Nguyen Thi Hoa Huyen³
¹Ha Dong General Hospital; ²Nam Dinh University of Nursing; ³Vin University

ABSTRACT

Objective: To evaluate the effectiveness of a health education intervention in improving stroke prevention knowledge among outpatients with hypertension at Ha Dong General Hospital. **Methods:** A single-group pretest–posttest study was conducted among 92 outpatients with hypertension at Ha Dong General Hospital between February and May 2025. Data were collected using a researcher-developed questionnaire assessing stroke prevention knowledge, which demonstrated a Cronbach's alpha coefficient of 0.75 during pilot testing. Knowledge was assessed at baseline, immediately after the intervention, and at a 1-month follow-up. **Results:** The mean overall stroke prevention knowledge score increased from 29.34 ± 2.88 at baseline to 36.71 ± 1.11 immediately after the intervention and remained at 36.14 ± 2.03 at the 1-month follow-up. Scores at both post-intervention assessments were significantly higher than at baseline ($p = 0.001$). The proportion of patients with good overall stroke prevention knowledge increased from 64.1% at baseline to 100% immediately after the intervention and remained at 100% at the 1-month follow-up. **Conclusion:** The health education intervention was associated with significant improvements in stroke prevention knowledge among outpatients with hypertension. These findings suggest the potential value of integrating structured stroke prevention education into routine outpatient nursing care. Follow-up education and knowledge reinforcement may help sustain these improvements.

Keywords: Stroke, hypertension, stroke prevention knowledge, health education intervention.

INTRODUCTION

Stroke is the third leading cause of death and a leading cause of disability worldwide. In 2019, approximately 101 million people worldwide were living with stroke¹. Globally, more than 12.2 million new stroke cases and approximately 6.5 million stroke-related deaths occur annually, and an estimated one in four adults aged 25 years

or older will experience a stroke during their lifetime¹. Among stroke survivors, approximately one-third to two-thirds experience permanent disabilities, 51% require assistance with self-care, 11% are unable to walk independently, and 14.4% experience job loss².

Hypertension is one of the most important modifiable risk factors for

stroke. Individuals with hypertension have approximately three times the risk of stroke compared with those without hypertension³. Improving stroke prevention knowledge among patients with hypertension is therefore essential for promoting preventive behaviors, facilitating early recognition of stroke symptoms, and encouraging timely access to emergency medical care. Health education interventions have been shown to play an important role in improving patients' knowledge and awareness of disease prevention⁴.

At the cardiology clinic of the Outpatient Department of Ha Dong General Hospital, approximately 1,500–2,000 patients with hypertension receive outpatient care each month. However, many patients have insufficient knowledge of stroke prevention, highlighting the need for targeted educational interventions. Therefore, this study was conducted to evaluate the effectiveness of a health education intervention in improving stroke prevention knowledge among outpatients with hypertension at Ha Dong General Hospital.

RESEARCH SUBJECTS AND METHODS

Study participants: The study included patients with hypertension receiving outpatient care at Ha Dong General Hospital in 2025.

Inclusion criteria: Patients aged 18 years or older who had no history of stroke and provided informed consent to participate in the study.

Exclusion criteria: Patients who were unable to hear, speak, or communicate clearly; failed to attend scheduled follow-up visits; or had previously participated in another stroke prevention health education program.

Study setting: The Cardiology Clinic, Outpatient Department, Ha Dong General Hospital, Vietnam.

Data collection period: February to May 2025.

Study design and sampling

A single-group pretest–posttest intervention design was employed, with assessments conducted before the intervention, immediately afterward, and at a 1-month follow-up.

Sample size calculation: The required sample size was estimated using the following formula:

$$n = \frac{Z_{(\alpha,\beta)}^2 [p_0(1 - p_0) + p_1(1 - p_1)]}{(p_0 - p_1)^2}$$

where: n: Required sample size. α : Type I error probability, set at .05, corresponding to a 95% confidence level. β : Type II error probability, set at .10, corresponding to 90% statistical power. p_0 : Proportion of patients with adequate stroke prevention knowledge before the intervention, estimated at 71.3% based on a previous study by Nguyen Hoai Thu⁵. p_1 : Expected proportion of patients with adequate stroke prevention knowledge after the intervention, estimated at 90%.

The calculated minimum sample size was 88 patients. Allowing for an anticipated 5% loss to follow-up at the 1-month assessment, the target sample size was increased to 92 patients.

Sampling method: Convenience sampling was used to recruit 92 eligible patients during the study period.

Health education intervention

The research team delivered an individualized health education intervention to each participant.

Intervention content: The educational materials were developed based on Decision No. 3312/QĐ-BYT, entitled “Guidelines for the Diagnosis and Treatment of Stroke” issued by the Vietnamese Ministry of Health on November 5, 2024 ⁶. The intervention provided information on stroke risk factors among patients with hypertension, early detection of stroke warning signs, and the potential consequences and complications of stroke for health, functional ability, employment, and quality of life.

Intervention procedure and assessment time points: Participants underwent three assessments:

- T1 (baseline): The initial assessment was conducted during a scheduled outpatient visit after the patient had received the physician’s prescription and collected the prescribed medications. Following this assessment, participants received an individualized health education and counseling session lasting approximately 20–30 minutes.

- T2 (immediate after intervention): The second assessment was conducted immediately after the health educational intervention.

- T3 (1-month follow-up): The final assessment was conducted approximately 1 month after the intervention, during the participant’s subsequent scheduled outpatient visit.

Data collection

Stroke prevention knowledge was assessed using a researcher-developed questionnaire based on Decision No. 3312/QĐ-BYT, “Guidelines for the Diagnosis and Treatment of Stroke” issued by the Vietnamese Ministry of Health on November 5, 2024 ⁶.

The questionnaire was developed in consultation with three experts and subsequently pilot-tested among 30 patients who were not included in the main study sample. The instrument demonstrated acceptable internal consistency, with a Cronbach’s alpha coefficient of .75.

The questionnaire comprised two sections:

Section 1: Demographic characteristics. This section collected participants’ demographic information, including age and gender.

Section 2: Stroke prevention knowledge. This section assessed two domains: knowledge about stroke (7 questions) and knowledge about stroke prevention (13 questions).

Scoring: Each correct response was assigned 1 point, whereas an incorrect response received 0 points. Knowledge scores were calculated and classified separately for knowledge about stroke, knowledge about stroke prevention, and overall stroke prevention knowledge. Based on the percentage of the maximum possible score, knowledge levels were categorized as good (> 75%–100%), moderate (50%–75%), or poor (< 50%).

Data analysis

Data were analyzed using SPSS statistical software, version 20.0. Categorical and ordinal variables were summarized using frequencies (n) and percentages (%), whereas continuous variables were summarized using means and variances. Paired-samples t tests were used to compare normally distributed continuous measurements, while the Mann–Whitney U test was used for nonnormally distributed continuous data.

Ethical considerations: The study protocol was approved by the Ethics Committee of Nam Dinh University of Nursing (Approval No. 575/GCN-HDDD), and permission to conduct the study was obtained from Ha Dong General Hospital. All participant information was kept confidential and used exclusively for research purposes. Participation in the study was entirely voluntary.

RESULTS

Sociodemographic characteristics of the study participants

Table 1. Age and gender distribution of the study participants (n = 92)

Characteristic		Frequency	Percentage
Age (years)	< 60	5	5.4
	60-69	39	42.4
	≥ 70	48	52.2
	Mean ± SD (min, max)	70.08 ± 8.09 (42-93)	
Sex	Male	39	42.4
	Female	53	57.6

A total of 92 patients with hypertension participated in the study. The mean age was 70.08 ± 8.09 years (range: 42–93 years), with participants aged 70 years or older accounting for the largest proportion (52.2%). Women represented 57.6% of the sample.

Table 2. Baseline knowledge about stroke among study participants (NCD) (n = 92)

Knowledge domain				Correct answer	
				Frequency	Percentage
Hypertension as a major stroke risk factor				76	82.6
Modifiable stroke risk factors.	Overweight or obesity	No exercise	Smoke	81	88.0
				75	81.5
				92	100.0
Nonmodifiable stroke risk factors.	Hereditary	Sex	Age	53	57.6
				35	38.0
				57	62.0
Recognition of stroke warning signs	Facial distortion, visual disturbances	Weakness or paralysis on one side of the body.	Speech impediment, unclear speech	92	100.0
				92	100.0
				92	100.0

Knowledge domain		Correct answer	
		Frequency	Percentage
Stroke treatment modalities	Use medication	92	100.0
	Rehabilitation	73	79.3
	Surgery	72	78.3
Purpose of rehabilitation: Improving activities of daily living		52	56.5
Consequences of stroke	Death	92	100.0
	Paralysis	92	100.0
	Memory loss	92	100.0
Stroke prevention measures	Eat a balanced diet and exercise regularly.	70	76.1
	Control blood pressure, avoid stress, and avoid sudden temperature changes.	92	100.0
	Monitor cholesterol levels.	35	38.0
Blood pressure monitoring and targets	Measure blood pressure daily and record it in a logbook.	70	76.1
	Recognizing a target blood pressure below 140/90 mmHg.	17	18.5
Medication adherence	Take your blood pressure medication as directed by your doctor.	73	79.3
	Do not stop taking your medication on your own just because you feel unwell from taking it.	36	39.1
	Do not stop taking blood pressure medication on your own when your blood pressure returns to normal levels, according to you.	52	56.5

As shown in Table 2, most participants correctly identified hypertension (82.6%), smoking (100%), overweight or obesity (88.0%), and physical inactivity (81.5%) as stroke risk factors. However, awareness of nonmodifiable risk factors was lower, particularly sex (38.0%), heredity (57.6%), and older age (62.0%).

All participants (100%) correctly recognized the assessed stroke warning signs, treatment with medication, and potential consequences of stroke. However, only 56.5% correctly identified the primary purpose of rehabilitation.

Regarding stroke prevention, all participants recognized the importance of blood pressure control, stress management, and avoiding sudden temperature changes, whereas only 38.0% identified cholesterol monitoring as a preventive measure. Although 76.1% recognized the importance of daily blood pressure monitoring, only 18.5% correctly identified the specified blood pressure target (<140/90 mmHg). Furthermore, while 79.3% understood the importance of medication adherence, fewer recognized the need to continue prescribed medication when experiencing discomfort (39.1%) or when blood pressure returned to normal (56.5%).

Table 3. Baseline stroke prevention knowledge among study participants (n = 92)

Knowledge domains	Items	Correct answer	
		Frequency	Percentage
Diet	Eat a low-salt diet.	92	100.0
	Limit fried and stir-fried foods.	92	100.0
Smoking cessation and alcohol restriction.	Quitting smoking, including traditional tobacco products.	92	100.0
	limit alcohol consumption.	92	100.0
Physical activity	Exercise for 30-60 minutes per day.	70	76.1
	Engaging in moderate-intensity exercise	75	81.5
	Exercise at least 5 times a week.	69	75.0
Follow-up care	Attending scheduled follow-up appointments as advised by a physician.	73	79.3
	Seeking medical attention when blood pressure exceeds normal levels.	35	38.0
	Seeking medical attention when experiencing symptoms such as dizziness or lightheadedness.	70	76.1
Response to signs of stroke.	Seeking immediate hospital care when stroke symptoms occur.	92	100.0
	Immediately calling 115, the emergency medical services number in Vietnam, when stroke symptoms occur.	92	100.0

All participants (100%) demonstrated correct knowledge of dietary recommendations and appropriate actions to take when stroke symptoms occur. Regarding physical activity, 76.1% correctly identified the recommended exercise duration of 30–60 minutes per day, 81.5% recognized the appropriate moderate intensity, and 75.0% identified a frequency of at

least five times per week. Regarding follow-up visits, 79.3% recognized the importance of attending appointments as scheduled by their physicians, whereas fewer identified the need to seek medical attention when blood pressure was elevated (38.0%) or when experiencing discomfort (76.1%).

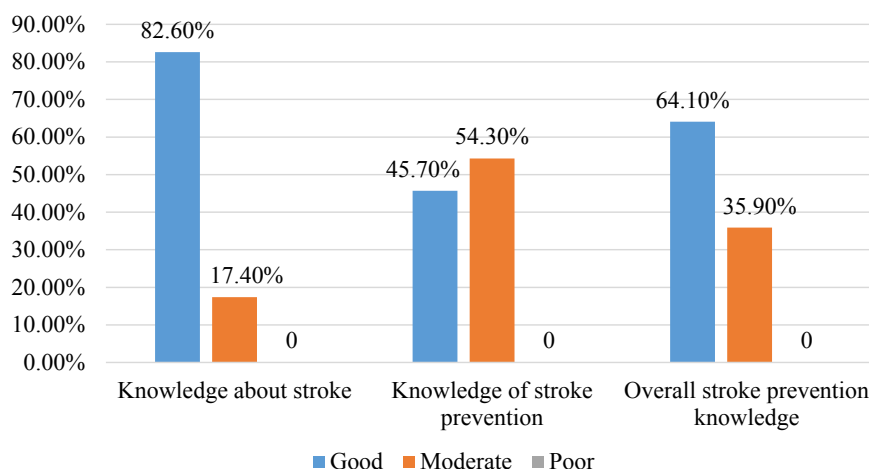


Figure 1. Distribution of baseline stroke prevention knowledge levels among study participants (n = 92)

At baseline, 82.6% of participants were classified as having good knowledge about stroke, whereas only 45.7% demonstrated good knowledge of stroke prevention. The proportion of participants with good overall stroke prevention knowledge was 64.1%. No participants were classified as having poor knowledge in any of the three domains.

Table 4. Changes in mean stroke prevention knowledge scores across assessment time points (n = 92)

Knowledge domain	Assessment time point	Mean $\pm$ SD	p-value (t-test)
Knowledge about stroke	T1	14.24 $\pm$ 1.77	$p_{(1,2)} = 0.001$ $p_{(1,3)} = 0.001$
	T2	16.91 $\pm$ 0.35	
	T3	16.79 $\pm$ 1.72	
Knowledge about stroke prevention	T1	15.11 $\pm$ 2.46	$p_{(1,2)} = 0.001$ $p_{(1,3)} = 0.001$
	T2	19.79 $\pm$ 0.79	
	T3	19.35 $\pm$ 1.61	
Overall stroke prevention knowledge	T1	29.34 $\pm$ 2.88	$p_{(1,2)} = 0.001$ $p_{(1,3)} = 0.001$
	T2	36.71 $\pm$ 1.11	
	T3	36.14 $\pm$ 2.03	

Note. T1 = baseline (before the intervention); T2 = immediately after the intervention; T3 = 1 month after the intervention.

As shown in Table 4, mean knowledge scores increased significantly from baseline (T1) to immediately after the intervention (T2) and at the 1-month follow-up (T3) across all domains (all $p = 0.001$). Overall knowledge scores increased from 29.34 ± 2.88 at T1 to 36.71 ± 1.11 at T2 and remained higher than baseline at T3 (36.14 ± 2.03).

Table 5. Distribution of knowledge levels before and after the health education intervention (n = 92)

Knowledge domain	Assessment time point	Good	Moderate	Poor
Knowledge about stroke	T1	82.6%	17.4%	0%
	T2	100%	0%	0%
	T3	100%	0%	0%
Knowledge about stroke prevention	T1	45.7%	54.3%	0%
	T2	100%	0%	0%
	T3	93.50%	6.5%	0%
Overall knowledge	T1	64.1%	35.9%	0%
	T2	100%	0%	0%
	T3	100%	0%	0%

Note. T1 = baseline; T2 = immediately after the intervention; T3 = 1-month follow-up.

As shown in Table 5, the proportion of participants with good knowledge increased across all domains following the intervention. Good overall knowledge increased from 64.1% at baseline (T1) to 100% immediately after the intervention (T2) and remained at 100% at the 1-month follow-up (T3). Similarly, good knowledge about stroke increased from 82.6% to 100%, while good knowledge about stroke prevention increased from 45.7% at baseline to 100% at T2 and 93.5% at T3.

DISCUSSION

Baseline stroke prevention knowledge among patients: The present study found that 82.6% of participants correctly identified hypertension as a major risk factor for stroke. Awareness of modifiable risk factors was also relatively high, with all participants (100.0%) recognizing smoking as a risk factor, followed by overweight or obesity (88.0%) and physical inactivity (81.5%). These proportions were higher than those reported by Nguyen Thi Linh ⁸ (51.0%), Hoang Thi Minh Thai ⁹ (73.5%),

and Nguyen Trong Hien ¹⁰ (21.6%) regarding knowledge of stroke risk factors. These findings suggest a relatively high level of awareness of modifiable stroke risk factors among the study participants, particularly the risks associated with smoking. Such knowledge may provide a foundation for adopting healthier lifestyles, improving treatment adherence, and engaging in stroke prevention behaviors.

Regarding recognition of stroke warning signs, all participants (100.0%) correctly identified typical symptoms, including

facial asymmetry, visual disturbances, unilateral weakness or paralysis, and speech difficulties. This proportion was considerably higher than that reported by Nguyen Thi Linh ⁸, whose study found that only 15.0% of patients recognized facial asymmetry, 12.1% recognized unilateral weakness or paralysis, and 8.1% identified slurred or unclear speech. Differences between studies, including that of Hoang Thi Minh Thai ⁹, may be attributable to variations in geographical location, study period, educational background, exposure to health education campaigns, and access to healthcare services. Public awareness campaigns promoting early stroke recognition using the FAST (Face, Arm, Speech, Time) framework, particularly through television, newspapers, and radio, may have contributed to greater awareness of stroke warning signs.

All participants (100.0%) also recognized that stroke can result in serious consequences, including death, paralysis, and memory impairment. These findings were higher than those reported by Nguyen Thi Linh ⁸, in which only 6.1% of patients recognized death as a potential consequence of stroke, 9.2% identified paralysis, and 4.0% recognized memory impairment. Awareness of these potentially severe consequences may encourage patients with hypertension to adhere to treatment recommendations and adopt preventive measures.

Despite relatively high awareness of stroke-related complications, only 56.5% of participants correctly identified the primary purpose of rehabilitation as improving the ability to perform activities of daily living. This proportion was lower than the 61.1% reported by Nguyen Thi Linh ⁸. Limited understanding of rehabilitation may reflect insufficient exposure to structured

rehabilitation programs or limited personal experience with rehabilitation services. These findings highlight the importance of incorporating information about rehabilitation into patient education during both inpatient and outpatient care.

Regarding blood pressure monitoring, 76.1% of participants correctly recognized the importance of measuring and recording blood pressure daily. This proportion was substantially higher than the 22.6% reported by Nguyen Trong Hien et al ¹⁰. Participants indicated that they had previously received information about hypertension from healthcare professionals, which may partly explain their awareness of blood pressure monitoring. However, only 18.5% correctly identified the specified blood pressure target of less than 140/90 mmHg, compared with 54.4% in the study by Nguyen Trong Hien et al ¹⁰. This discrepancy suggests that although many participants understood the importance of regular blood pressure monitoring, their knowledge of specific blood pressure control targets remained limited.

With respect to stroke prevention measures, all participants (100.0%) recognized the importance of controlling blood pressure, managing stress, and avoiding sudden temperature changes. This proportion was higher than those reported by Nguyen Thi Linh ⁸ (3.8%) and Hoang Thi Minh Thai ⁹ (17.4%). However, only 38.0% of participants recognized the importance of monitoring cholesterol levels. Elevated cholesterol contributes to atherosclerosis and is an important modifiable cardiovascular risk factor ^{6, 11}. Therefore, health education programs should place greater emphasis on lipid monitoring and management as components of comprehensive stroke risk reduction.

Regarding adherence to antihypertensive medication, 79.3% of participants correctly recognized the need to take medication as prescribed by a physician. However, fewer participants understood that antihypertensive medication should not be discontinued without medical advice when experiencing discomfort (39.1%) or when blood pressure returns to normal (56.5%). The proportion recognizing the importance of medication adherence was slightly lower than the 80.9% reported by Nguyen Trong Hien et al ¹⁰. Insufficient understanding of long-term antihypertensive treatment and the management of medication-related adverse effects may contribute to treatment discontinuation or inconsistent medication use ¹². Nurses should therefore provide individualized counseling on medication adherence, recognition and management of adverse effects, and the importance of consulting healthcare professionals before making changes to prescribed treatment.

Regarding follow-up care, 79.3% of participants recognized the importance of attending scheduled appointments as recommended by their physicians, while 76.1% understood the need to seek medical attention when experiencing symptoms such as dizziness or lightheadedness. However, only 38.0% recognized the need to seek medical evaluation when blood pressure exceeded normal levels. These findings suggest that participants had relatively good awareness of scheduled follow-up care but less comprehensive knowledge of when additional medical assessment may be necessary.

Furthermore, all participants (100.0%) correctly identified the need to seek immediate hospital care and contact emergency medical services by calling 115 when stroke symptoms occur. This

finding was consistent with that reported by Nguyen Thi Linh ⁸. Awareness of the need for an immediate emergency response is particularly important because timely recognition and treatment of stroke can help minimize neurological injury and improve clinical outcomes.

At baseline, 82.6% of participants were classified as having good knowledge about stroke, whereas only 45.7% demonstrated good knowledge of stroke prevention. Overall, 64.1% were classified as having good stroke prevention knowledge. These findings were higher than those reported by Hoang Thi Minh Thai⁹, whose study identified 23.5% of patients with good knowledge, 43.9% with moderate knowledge, and 32.6% with poor knowledge. Differences in patient characteristics and clinical settings may partly explain these findings. Participants in the present study were outpatients receiving ongoing hypertension management, some of whom may have previously received hypertension-related education during hospital treatment. In contrast, the study by Hoang Thi Minh Thai included hospitalized patients receiving treatment for more severe conditions. These findings highlight the need for health education programs that extend beyond the provision of information to incorporate practical self-management skills, particularly blood pressure monitoring, healthy dietary practices, regular physical activity, and medication adherence.

Changes in stroke prevention knowledge following the health education intervention: The present study demonstrated significant improvements in stroke prevention knowledge following the health education intervention, with higher scores observed immediately after the intervention and at the 1-month follow-up

compared with baseline (all reported $p = .001$). Specifically, the mean overall stroke prevention knowledge score increased from 29.34 ± 2.88 at baseline (T1) to 36.71 ± 1.11 immediately after the intervention (T2) and remained at 36.14 ± 2.03 at the 1-month follow-up (T3). These findings suggest that the observed improvement in knowledge was maintained over the short-term follow-up period.

Improvements were also observed in the proportions of participants classified as having good knowledge across all three domains. The proportion with good knowledge about stroke increased from 82.6% at baseline to 100.0% at both postintervention assessments. Similarly, the proportion with good stroke prevention knowledge increased from 45.7% at baseline to 100.0% immediately after the intervention and remained at 93.5% after 1 month. The proportion with good overall stroke prevention knowledge increased from 64.1% at baseline to 100.0% at both postintervention assessments. No participants were classified as having poor knowledge at any assessment time point. These findings indicate substantial improvements in knowledge following the educational intervention, although the magnitude of improvement varied slightly across knowledge domains.

The observed improvements are consistent with the findings of Vu Van Dau et al.⁴, who reported positive changes in practices related to the prevention of complications among patients with hypertension following an educational intervention. Although the two studies assessed different outcomes, their findings suggest that structured health education may play a valuable role in supporting hypertension management and stroke prevention. Such educational

approaches may be particularly relevant in outpatient settings, where opportunities for comprehensive and systematic patient education can be limited.

From a health behavior perspective, knowledge is considered an important prerequisite for understanding disease-related risks, treatment goals, and the potential consequences of nonadherence¹³. Greater knowledge may encourage patients to engage more actively in self-management activities, including blood pressure monitoring, medication adherence, dietary modification, regular physical activity, and attendance at scheduled follow-up appointments. This interpretation is consistent with the view that disease-related knowledge contributes to the development and maintenance of self-care behaviors among patients with hypertension¹⁴. Nevertheless, improvements in knowledge should not be interpreted as direct evidence of behavioral change, as actual self-management practices were not evaluated in the present study.

The high proportion of participants maintaining good knowledge at the 1-month follow-up suggests that the individualized health education approach may have been appropriate for the study population. The intervention content was based on current professional guidelines and addressed practical aspects of stroke prevention relevant to patients with hypertension. However, the decrease in the proportion of participants with good stroke prevention knowledge from 100.0% immediately after the intervention to 93.5% at the 1-month follow-up suggests that some knowledge may decline over time. Periodic reinforcement and follow-up education may therefore be beneficial for maintaining knowledge gains beyond the initial intervention.

Taken together, these findings support the potential value of integrating structured health education into routine outpatient care for patients with hypertension. Healthcare institutions could consider providing stroke prevention counseling during scheduled follow-up visits, standardizing educational content according to Ministry of Health guidelines, and using digital communication platforms, such as Zalo or Messenger, to deliver reminders, reinforce key information, and support ongoing patient self-management. However, the effectiveness of these additional approaches in improving long-term knowledge retention, health behaviors, and stroke-related outcomes requires further investigation.

Study limitations

Although the study demonstrated improvements in stroke prevention knowledge following the health education intervention, several limitations should be acknowledged. First, the relatively small sample size and single-center setting may limit the generalizability of the findings. Second, the single-group pretest–posttest design without a control group limits the ability to attribute the observed improvements solely to the intervention.

CONCLUSION

This study evaluated changes in stroke prevention knowledge following a health education intervention among 92 outpatients with hypertension at Ha Dong General Hospital in 2025. At baseline, 64.1% of participants demonstrated good overall stroke prevention knowledge. Following the intervention, this proportion increased to 100% both immediately after the intervention (T2) and at the 1-month follow-up (T3). Mean knowledge scores

were also significantly higher at both postintervention assessments than at baseline ($p < 0.05$). These findings suggest that structured health education may improve stroke prevention knowledge among patients with hypertension, with improvements maintained over a 1-month period. Integrating regular health education and knowledge reinforcement into routine outpatient care may help support stroke prevention efforts in this population.

REFERENCES

1. Feigin VL, Brainin M, Norrving B, et al. World Stroke Organization (WSO): global stroke fact sheet 2022. *Int J Stroke*. 2022;17(1):18-29. doi:10.1177/174749302110659175
2. Vietnam Ministry of Health. Guidelines for Rehabilitation Personnel and Collaborators on Community-Based Rehabilitation. Vietnam Ministry of Health; 2008.
3. Nguyen Minh Hien. *Stroke*. Medical Publishing House; 2013.
4. Vu Van Dau, Trinh Thi Nhung, Dinh Thang Loi. Changes in knowledge and practices regarding the prevention of complications among inpatients with hypertension at Quang Ninh Traditional Medicine and Pharmacy Hospital. *Journal of Community Medicine*. 2024;65(2). doi:10.52163/yhc.v65iCD2.1029 IF: NA NA NA
5. Nguyen Hoai Thu. Knowledge and attitudes toward stroke prevention among patients with hypertension at Gia Loc District Health Center, Hai Duong Province in 2023. *Journal of Nursing Science*, Vol. 7 No. 01 (2024); 2024. DOI: 10.54436/jns.2024.01.717

6. Vietnam Ministry of Health. Decision No. 3312/QĐ-BYT: Guidelines for the Diagnosis and Treatment of Stroke. Issued November 5, 2024.
7. Al-Rawajfah OM, Al-Mugeed KA, Alaloul F, et al. COVID-19 knowledge, attitudes, and precautionary practices among health professional students in Oman. *Nurse Educ Pract.* 2021;52:103041. doi:10.1016/j.nepr.2021.103041 IF: 4.5 Q1 B2
8. Nguyen Thi Linh. Stroke prevention knowledge among patients with hypertension at Nam Dinh Provincial General Hospital in 2024. *Vietnam Medical Journal.* 2025;3.
9. Hoang Thi Minh Thai. Stroke prevention knowledge among outpatients with hypertension at Nghia Dan District Health Center, Nghe An Province, in 2024. *Vietnam Journal of Community Medicine.* 2024;66(1):27-32. DOI:10.52163/yhc.v66i1.1902
10. Nguyen Trong Hien, Phan Kieu My, Nguyen Thi Mai Trinh, et al. Knowledge and attitudes toward the prevention of hypertension-related complications and associated factors among outpatients at Can Tho University of Medicine and Pharmacy Hospital. *Can Tho Journal of Medicine and Pharmacy.* No. 60 (2023). DOI: 10.58490/ctump.2023i60.198
11. Vietnam Ministry of Health. Decision No. 5331/QĐ-YT: Guidelines for the Diagnosis and Management of Stroke. Issued December 23, 2020.
12. Burnier M, Egan BM. Adherence in hypertension. *Circ Res.* 2019;124:1124-1140. doi:10.1161/CIRCRESAHA.118.313220 IF: 18.0 Q1 B1
13. Lu H. Community-based interventions in hypertensive patients: a comparison of three health education strategies. *BMC Public Health.* 2015;15:33. doi: 10.1186/s12889-015-1401-6.
14. Vu Thi Thanh Huong. Self-care behaviors and associated factors among outpatients with hypertension at Gia Lai Provincial General Hospital in 2019. *Nam Dinh University of Nursing;* 2019.