The Effectiveness of FAST Method Education in Early Stroke Detection Efforts for Hypertensive Patients at Pa'betengang Community Health Center, Bantaeng

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A R T I C L E   I N F O

A B S T R A C T

Stroke is a major complication of hypertension that leads to disability and death; however, knowledge among hypertensive patients regarding the early signs of stroke remains low. This study aimed to evaluate the effectiveness of the FAST (Face, Arm, Speech, Time) educational method in improving early stroke detection skills among hypertensive patients. A one-group pre-experimental pre-post design was used, involving 60 hypertensive patients at the Pa'betengang Community Health Center, Bantaeng Regency. The education was delivered in two sessions using visual media and interactive simulations. Knowledge was measured using a questionnaire administered before and after the intervention. The results showed an increase in the average knowledge score from 10.63 (SD ±2.85) to 17.18 (SD ±1.96) after the intervention, with a statistically significant difference (p < 0.001). The FAST method of education was proven effective in enhancing early stroke detection abilities among hypertensive patients. This intervention is recommended as an educational strategy in promotive programs within primary healthcare services.

1. INTRODUCTION

Stroke is one of the major non-communicable diseases (NCDs) that significantly impacts public health, both in terms of morbidity and mortality(Manurung et al., 2024). In Indonesia, stroke is the leading cause of death and long-term disability, particularly among adults and the elderly(Zhong et al., 2022). According to the Basic Health Research (Riskesdas) data from(Kemenkes, 2018), the prevalence of stroke in Indonesia reached 10.9 per 1,000 population, showing an increasing trend over the years. One of the main risk factors contributing to the incidence of stroke is hypertension.

Uncontrolled hypertension can damage blood vessels, including cerebral arteries, thereby increasing the risk of stroke(Martin et al., 2024). This condition is often referred to as the "silent killer" because it typically presents no obvious symptoms until serious complications like stroke occur(Diah Purnamayanti et al., 2020). Unfortunately, despite the high prevalence of hypertension in the community, patients' awareness of the risk of stroke complications remains low. This indicates a problem in health literacy, especially in recognizing early signs and symptoms of stroke(Annas et al., 2021). The low ability of hypertensive patients to detect early signs of stroke is a critical issue, as it leads to delayed medical intervention, thereby increasing the risk of permanent disability and death(García-Terriza et al., 2021). This condition not only decreases the quality of life of affected individuals but also adds an economic and psychosocial burden to families and the healthcare system. Therefore, comprehensive strategies for stroke prevention and management are urgently needed.(Wijaya et al., 2024).

Primary healthcare facilities such as community health centers (Puskesmas) play a strategic role in health promotion and disease prevention, particularly in managing chronic

conditions like hypertension. However, challenges in the field are substantial, including poor community health literacy, limited educational resources, and a lack of effective and engaging educational approaches(Asri & Hakim, 2024). As the first line of health services, Puskesmas are expected to provide regular education and screening for high-risk patients such as those with hypertension. One educational approach proven effective in various countries for improving early stroke detection is the FAST method (Face, Arm, Speech, Time). This method is designed to be simple and visual, enabling the public to easily recognize stroke symptoms: changes in the face, weakness in the arm, speech difficulties, and the urgency of seeking immediate medical assistance(Manurung et al., 2024). Educational programs using the FAST method have been shown to increase public awareness and reduce the time to hospital arrival, ultimately improving stroke prognosis.

Nevertheless, the structured and interactive implementation of the FAST method in primary healthcare settings in Indonesia remains limited, particularly in non-metropolitan areas such as Bantaeng Regency. Few studies have evaluated the effectiveness of this method when delivered through visual media, simulation, and participatory techniques within the context of Puskesmas. Preliminary observations in the working area of Puskesmas Pa'betengang, Bantaeng Regency, revealed that most hypertensive patients lacked sufficient understanding of the early signs and symptoms of stroke. Consequently, many patients sought medical care late during a stroke episode, leading to worsened outcomes, increased treatment complexity, and higher risks of permanent disability or death. To address these challenges, this study aims to develop and evaluate the effectiveness of FAST method-based education in improving early stroke detection among hypertensive patients at Puskesmas Pa'betengang, Bantaeng Regency. The educational intervention is delivered interactively using visual aids such as posters and videos, combined with live simulations to encourage active patient engagement. This approach is expected to enhance patient comprehension and information retention, enabling them to respond more quickly when stroke symptoms occur.

The novelty of this study lies in the integration of the FAST method into an interactive education program tailored to the primary care context. By filling the gap in literature regarding the effectiveness of this method in Indonesia, especially among high-risk populations, the results of this study are expected to serve as a foundation for developing more systematic, effective, and replicable educational models for use in Puskesmas nationwide.

2. METHOD

This study employed a pre-experimental design using a *one group pre-test and post-test* approach. This design involved a single group of subjects who were administered a pre-test prior to receiving the FAST method educational intervention, followed by a post-test after the intervention to assess changes in knowledge or early stroke detection ability. The population of this study consisted of all hypertensive patients registered and receiving treatment within the working area of Pa'betengang Community Health Center (Puskesmas), Bantaeng Regency.

The sample included a portion of hypertensive patients from the population who met the inclusion criteria. The sampling technique used was purposive sampling, with the following inclusion criteria: Patients aged ≥ 30 years, Diagnosed with hypertension by healthcare professionals, Able to read and comprehend instructions, Willing to participate as research respondents. The sample size was determined using the formula for comparing two means (pre-post), resulting in a total of 60 respondents.

The data sources in this study included pre-test and post-test data collected through a knowledge questionnaire on stroke symptoms based on the FAST method. Results of interviews and direct observations during the educational sessions. Secondary Data are Medical records of hypertensive patients from Pa'betengang Community Health Center, Reports on the number of stroke and hypertension cases in the health center's service area, Supporting documents such as the 2018 Basic Health Research (Riskesdas) report and data from the local Health Office.

The method section is presented in such a way that it enables readers to replicate the study accurately. It includes research design, population, sample, data sources, research instruments or tools, and data analysis procedures.

Tools and Materials. This study utilized a knowledge questionnaire on early stroke detection, developed based on the FAST method indicators (Face, Arm, Speech, Time). The knowledge instrument was designed by the researchers with reference to educational materials and quizzes from the American Stroke Association as a global standard. The questionnaire underwent content validation by a panel of experts in nursing and neurology, and was tested for reliability before being used at Pa'betengang Health Center.

The questionnaire was structured as a multiple-choice format, with content validity assessed through expert review and empirical validity tested via a small-scale pilot study. In addition, visual educational media were used, including informative leaflets and educational videos that explain the FAST method in a simple and practical manner. Simulation of early stroke symptom detection was conducted using anatomical dolls and basic visual aids to enhance symptom recognition. Writing tools and documentation equipment were also used to support data collection before and after the intervention.

Study Implementation

The study employed a pre-experimental design with a *one group pre-test and post-test* approach. It was conducted in the working area of Pa'betengang Community Health Center, Bantaeng Regency, South Sulawesi, during April–May 2024. The population included all hypertensive patients who routinely visited the health center. A total of 60 respondents were selected using purposive sampling based on inclusion criteria: diagnosed with hypertension, aged ≥30 years, literate, and willing to participate in the educational program.

Before the intervention, respondents completed a pre-test to measure baseline knowledge of early stroke symptoms. The intervention consisted of two educational sessions, each lasting 45–60 minutes, which included material presentations, educational video screenings, and live simulation practices. After completing the entire educational program, respondents were asked to complete a post-test using the same instrument as the pre-test. Non-participatory observations were also conducted throughout the activities.

Data Analysis

Data obtained from the pre-test and post-test were analyzed using SPSS version 25. Normality was assessed using the Shapiro-Wilk test. As the data were normally distributed, a paired sample t-test was performed to determine the difference in knowledge scores before and after the intervention. The level of statistical significance was set at $p < 0.05$. The results of this analysis were used to evaluate the effectiveness of the FAST method educational intervention in improving early stroke detection knowledge among hypertensive patients.

3. RESULT AND DISCUSSION

Result

This study was conducted to evaluate the effectiveness of the FAST (Face, Arm, Speech, Time) method education in improving community knowledge regarding early detection of stroke symptoms in the working area of Pa'betengang Community Health Center. Educational interventions were delivered to 60 respondents selected through purposive sampling. The following section presents the results and discussion of this study.

Tabel 1. Respondent Characteristics Based on Age, Education Level, and Health Center Visits

No	Respondent Characteristics	Category	Frequency (n)	Percentage (%)
1	Age (years)	36–45	12	20.0
		46–55	20	33.3
		56–65	18	30.0
		> 65	10	16.7
	Total		**60**	**100**

No	Respondent Characteristics	Category	Frequency (n)	Percentage (%)
2	Education Level	No formal education	5	8.3
		Elementary School	18	30.0
		Junior High School	20	33.3
		Senior High School	12	20.0
		Higher Education	5	8.3
	Total		**60**	**100**
3	Visits to Health Center	First-time visit	14	23.3
		1–2 previous visits	26	43.3
		> 2 previous visits	20	33.3
	Total		**60**	**100**

Respondents' knowledge was measured using a questionnaire administered before (pre-test) and after (post-test) the educational intervention. The results are summarized in Table 2.

Table 2. Mean Knowledge Scores Before and After FAST Method Education

No	Variable	Mean (± SD)	Minimum Score	Maximum Score
1	Knowledge (Pre-Test)	10.63 ± 2.85	5	17
2	Knowledge (Post-Test)	17.18 ± 1.96	13	20

Furthermore, the distribution of minimum and maximum scores also showed improvement across all levels of knowledge. The minimum score increased from 5 to 13, and the maximum score increased from 17 to 20, indicating a uniform improvement in knowledge among respondents. A paired sample t-test was conducted to evaluate the statistical significance of the knowledge score difference. The results showed a significant difference ($p < 0.001$) between the pre-test and post-test scores, indicating that the observed increase did not occur by chance.

Table 3. Paired Sample t-Test Results: Pre-Test vs Post-Test Knowledge Scores

Variable	Mean (Pre-Test)	Mean (Post-Test)	Mean Difference	t-value	Sig. (2-tailed)
Knowledge Score	57.23	84.67	27.44	13.892	< 0.001

Discussion

The results of the study showed a significant increase in respondents' knowledge scores after receiving education using the FAST (Face, Arm, Speech, Time) method. The average knowledge score increased from 10.63 before the education to 17.18 after the intervention, reflecting the effectiveness of this method in enhancing participants' understanding of early stroke detection. This improvement indicates that a visual and simulation-based educational approach can help hypertensive patients more easily recognize the early symptoms of stroke. This finding aligns with previous studies that suggest simple and easy-to-understand educational methods such as FAST can effectively raise public awareness of medical emergencies like stroke(Noviar et al., 2024). Changes in the minimum and maximum scores also demonstrated a uniform increase in knowledge among all respondents. The minimum score increased from 5 to 13, while the maximum score rose from 17 to 20. This suggests that knowledge improvements were not limited to a select group of participants, but were experienced by all respondents, indicating that the FAST education was beneficial even for those with very low initial knowledge levels.

Nonetheless, the overall improvement in scores does not rule out the possibility of individual variations in response(Effect et al., n.d.). Although no inferential statistical analysis was conducted on demographic characteristics, descriptive observations revealed that younger participants and those with a higher level of education tended to show greater score increases compared to older or less educated individuals(Dev et al., 2022). In addition, participants who had

previously attended health education sessions showed faster comprehension of the material. These findings highlight the need to tailor educational approaches according to target group characteristics for more optimal outcomes.(Zhong et al., 2022)

This study is consistent with research by (Gurková et al., 2023) in Yogyakarta, which showed a significant increase in knowledge scores from 11.2 to 16.9 (p < 0.01) after audio-visual-based FAST education. A study by (Medea et al., 2021) in Surabaya also emphasized the importance of delivering education in an interactive and accessible manner through media such as leaflets and animated videos. Additionally, the use of teaching aids such as anatomical mannequins in this study supports findings from (Pribadiani et al., 2023), which demonstrated that direct symptom simulation can enhance long-term retention in educational participants.

The educational approach in this study was also contextually adapted to the local culture, using everyday language that was easily understood by respondents(Gjyzari & Marsh, 2025). This is in line with the principles of community-based education, as discussed by (He et al., 2024), which emphasize the importance of integrating local context into health communication to ensure better acceptance and impact. Despite demonstrating the effectiveness of the intervention, this study had several limitations. First, the pre-experimental one-group pre-test–post-test design lacked a control group, making it difficult to attribute the observed knowledge improvements solely to the intervention without accounting for external factors. Second, the short duration of observation did not allow for evaluation of the long-term retention of the educational impact, suggesting the need for follow-up studies with longer post-intervention assessments. Third, using the same instrument for both the pre-test and post-test may have introduced recall bias, as participants might have remembered their previous answers when completing the post-test.

The findings of this study have important implications for nursing practice, especially in health promotion within primary care settings. Health professionals such as community nurses, health cadres, and health promoters play a strategic role in delivering FAST method education on an ongoing basis. They can serve as key agents in disseminating information through visual, simulation-based, and culturally relevant approaches to ensure that the content is easily understood and well received by the community. Community health centers (Puskesmas) should incorporate FAST education into their routine programs for hypertensive patients, not only through health talks but also through simulation practice. Interactive media such as videos, leaflets, and anatomical mannequins have proven effective in enhancing understanding and should be adopted more broadly.

These findings are also in line with results from international studies. The Centers for Disease Control and Prevention (CDC) and the World Health Organization (WHO) have promoted the FAST method in global public campaigns to improve early stroke detection. A study by Carrera et al. (2019) in Spain found that community- and primary care-based FAST campaigns successfully increased public awareness and reduced delays in hospital arrival. Similarly, research by Chiu et al. (2020) in Taiwan demonstrated that FAST-based education programs delivered by community health workers significantly improved public knowledge and preparedness in responding to stroke.

FAST method education has been shown to be effective in increasing early stroke detection knowledge among hypertensive patients. Nevertheless, further studies using stronger experimental designs, longer intervention durations, and multivariate analyses of the factors influencing knowledge improvement are highly recommended. This study suggests that the FAST method should be integrated into routine educational programs in primary healthcare services, with healthcare professionals serving as the primary facilitators(Wijaya et al., 2024)

4. CONCLUSION

The FAST method education has proven effective in enhancing the ability of hypertensive patients at Pa'betengang Primary Health Center, Bantaeng Regency, to detect early symptoms of stroke. Education based on visual media and simulation offers a stronger and more practical understanding in recognizing early signs of stroke, enabling quicker responses and preventing more severe complications. These findings support the implementation of the FAST method as a

feasible preventive educational strategy to be integrated into primary health promotion programs. Further research is recommended to assess the long-term effectiveness of this intervention and its applicability to populations with varying characteristics to broaden the generalizability of the results.

5. ACKNOWLEDGE

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