

The Impact of Health Seeking Behavior and Awareness About Stroke on Delays in Patient Arrivals at The Emergency Department of Blitar General Hospital

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Abstract

Delays in accessing timely medical care for stroke patients remain a major challenge, as treatment effectiveness is highly dependent on early intervention. Nursing plays a pivotal role in reducing such delays through identifying contributing factors, educating communities on stroke recognition, and advocating for rapid access to emergency care. This study aimed to examine the impact of health-seeking behavior and stroke awareness on delays in patient arrivals at the Emergency Department (ED) of Blitar General Hospital. A cross-sectional prospective design was employed, involving 100 respondents selected by consecutive sampling, consisting of stroke patients and their accompanying relatives. Data were analyzed using path analysis with SMART PLS (Partial Least Squares). Results showed that 72% of patients were aged over 55 years, 53% were female, 42% had elementary education, and 32% were entrepreneurs or housewives. Despite 79% having received stroke-related information, 65% arrived at the ED more than three hours after symptom onset, and only 40% sought immediate care. Health-seeking behavior had a direct influence on delays (OR = 7.292), while awareness had an indirect effect (OR = 12.595). These findings underscore the importance of strengthening public education, improving emergency access, and implementing nursing-led interventions to reduce delays and enhance stroke outcomes.

Keywords: Awareness; Emergency room; Health-seeking behavior; Stroke

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1. Introduction

Stroke is a leading cause of mortality and long-term disability worldwide, necessitating urgent medical attention to optimize patient outcomes. The World Stroke Organization Feigin et al., (2022) reported that timely intervention is critical in minimizing mortality and improving functional outcomes. Early intervention, including thrombolytic therapy and endovascular treatments, has been shown to significantly reduce mortality and disability rates (Cheng et al., 2024; Randhawa et al., 2022). However, delays in seeking and receiving treatment remain prevalent, particularly in low- and middle-income countries (Pandian et al., 2020). Understanding the factors influencing delays in recognizing stroke symptoms and seeking medical care is critical to improving emergency response systems and patient education initiatives.

In Indonesia, stroke has been identified as the leading cause of death and disability, contributing significantly to the national disease

burden (Kemenkes RI, 2022). Economic evaluations by BPJS Kesehatan, (2020) have also indicated that stroke treatments impose high financial burdens, stressing the importance of prompt intervention to reduce costs and improve outcomes.

Delays in the arrival of stroke patients at hospitals have become a global concern. Previous studies indicate that factors such as education level, awareness of stroke symptoms, and access to healthcare services influence the time taken by patients to seek medical help (Berg et al., 2023; Nathisuwan et al., 2022). For instance, in Saudi Arabia, a study by (Alkhotani et al., 2022) found that a lack of knowledge about stroke symptoms and available treatments led to delayed arrival at emergency departments. Supported Tang et al., (2022) conducted a study on ischemic stroke in young adults, revealing that lack of awareness about stroke symptoms and risk factors significantly contributed to treatment delays.

Similar findings were reported by Bolatturk, (2023) in Turkey and Iversen et al., (2021) in Denmark, highlighting the role of social and cultural factors in influencing patients' decisions to seek care promptly

A study conducted by Nathisuwan et al., (2022) in Indonesia also revealed that delays in seeking medical assistance occur due to limited public education about stroke symptoms and the importance of quick treatment. Additionally, transportation challenges and dependence on family members for medical decision-making further exacerbate the issue (Jusuf et al., 2023). In rural and semi-urban areas like Blitar, these challenges become more complex due to limited healthcare infrastructure and low public awareness (Pandian et al., 2023).

Blitar is a region facing specific challenges in stroke management, although it has been equipped with an emergency ambulance service (Wlingi Emergency Medical Service) which can be accessed 24 hours to speed up emergency services, until now its existence has not been optimized in transporting stroke patients, because there is an assumption that patients who are transported by ambulance are patients with very serious conditions who ultimately cannot be helped/die and families prefer to use private vehicles to the hospital. Studies conducted by Tang et al., (2022) and Zhang et al., (2023) indicate that rural areas experience higher delays compared to urban areas. Factors such as distance to healthcare facilities, road conditions, and reliance on traditional transportation methods are major barriers. Moreover, cultural perceptions and community beliefs about illness also contribute to delays in seeking medical assistance (Iktidar et al., 2024).

This study contributes to nursing by providing a scientific foundation to strengthen the role of nurses in identifying factors influencing delays in stroke patient arrivals at hospitals. Stroke code activation by nurses has been shown to play a pivotal role in accelerating emergency response and timely interventions, as nurses are often the first health professionals to recognize acute stroke symptoms (Snaveley & Thompson, 2023). Furthermore, nurse-led community education interventions have demonstrated significant improvements in public awareness of stroke signs and appropriate emergency responses (Abbasian et al., 2024). Based on these findings, nurses can advocate for more responsive stroke care policies, strengthen referral systems, and design community-based interventions targeting health-seeking behavior. Thus, this study contributes not only to the advancement of academic nursing knowledge but also to improving the quality of nursing

services and stroke patient outcomes at both clinical and community levels

Therefore, this study aims to explore health-seeking behavior and public awareness about stroke and their impact on delays in patient arrivals at the Emergency Department of Blitar General Hospital. The findings are expected to provide a more comprehensive understanding of the challenges faced in stroke management and to develop more effective intervention strategies to address this issue.

2. Method

Research Design

This study employs an observational research design with a cross-sectional approach.

Place and Time of Study

The research was conducted at the Emergency Departments of general hospitals in Blitar Regency. Blitar Regency has two main general hospitals: Ngudi Waluyo Wlingi General Hospital, which serves as the referral hospital for the eastern region, and Srengat General Hospital, which serves as the referral hospital for the western region. Both hospitals are equipped with comprehensive medical support facilities, including CT-Scans. The study was carried out from August to November 2024.

Ethical Clearance

This study obtained ethical approval from the Health Research Ethics Committee (KEPK) of Ngudi Waluyo Wlingi General Hospital (Approval No: B/070/1530/409.52.4/2024). Research permission was also granted by BAKESBANGPOL of Blitar Regency and the Director of Ngudi Waluyo Wlingi General Hospital.

Population and Sample

The study population included all stroke patients and their family members who were directly involved in bringing the patients to the ED after a stroke episode. The sample size consisted of 100 stroke patients and their accompanying family members, selected through consecutive sampling. Stroke diagnosis was determined by a neurologist based on the identification of stroke signs and symptoms by ED physicians, subsequently confirmed through CT-Scan examinations.

Data Measurement

The instruments used in this study included observation sheets, structured interview sheets, and questionnaires. Observation sheets were used to record stroke severity, presenting symptoms, vital sign results (blood pressure, heart rate), body mass index (BMI), blood glucose test results, electrocardiography (ECG), CT-Scan results, and the time delay in arrival at the ED.

Structured interviews were conducted to identify patient arrival times, stroke onset, awareness, and

health-seeking behavior following a stroke episode. Awareness of stroke risk factors and symptoms was measured using four questions. For the first question, respondents who recognized the presence or absence of risk factors received a score of 1, while those who did not recognize them received a score of 0. For the second question, respondents who were aware of at least one stroke symptom received a score of 1, whereas those who did not recognize any symptoms in themselves received a score of 0. For the third question, respondents who answered that they would go to the Emergency Department (ED) received a score of 1, while responses other than ED were scored 0. For the fourth question, respondents who answered ED or Emergency Medical Services (EMS) received a score of 1, while responses other than ED or EMS were scored 0.

Data Analysis

The data obtained, including type of transportation, age, education, family background, insurance ownership, sources of information, stroke awareness, responses to symptom onset, and time of arrival at the ED, were analyzed using descriptive statistics. To examine the direct and indirect effects of health-seeking behavior and stroke awareness, path analysis was conducted using SMART PLS (Partial Least Squares).

3. Results and Discussion

Based on Table 1, it can be interpreted that 72% of stroke patients are over 55 years old, 53% are female, 42% have elementary school education, 32% work as farmers, 79% have received information about stroke, 61% have fewer than two sources of information about stroke, and 72% are classified as having ischemic stroke (see Table 1).

The findings from Table 1 reveal several important characteristics about stroke patients that is 72% of stroke patients being over 55 years old, it reflects the well-established correlation between age and stroke incidence. According to various studies [Kalkonde et al., \(2023\)](#); [Pandian et al., \(2020\)](#), the risk of stroke increases with age due to the accumulation of cardiovascular risk factors and the natural aging process of blood vessels. This finding is consistent with global stroke epidemiology, where older adults represent a significant proportion of stroke patients ([Feigin et al., 2022b](#); [Jiang et al., 2024](#)).

The fact that 53% of stroke patients are female aligns with findings from studies such as [Zhang et al., \(2023\)](#) and [Iktidar et al., \(2024\)](#), which indicate that gender plays a role in stroke occurrence, though the gender gap can vary by region and type of stroke. While males tend to have a higher overall incidence of stroke, females generally experience strokes later in life and are

more likely to have poorer post-stroke outcomes, as noted in multiple studies ([Pandian et al., 2023](#); [Terecoasă et al., 2022](#); [Wanichanon et al., 2024](#)).

Table 1. Characteristics of Stroke Patients in the Emergency Department of Regional General Hospital in Blitar Regency

The Demographic Characteristics	n	Percentage (%)
Age		
≤45 years	3	3
46-55 years	25	25
>55 years	72	72
Gender		
Male	47	47
Female	53	53
Education		
Primary	42	42
Yunior High	18	18
High School	33	33
University	4	4
No school	3	3
Work		
Self-employed	32	32
Farmer	22	22
Housewife	32	32
Retired/Government employees	13	13
Teachers	1	1
Receiving information:		
No	21	21
Yes	79	79
Source of Information		
< 2 resources of information	61	61
2-3 resources of information	32	32
4 resources of information	6	6
>4 resources of information	1	1
Type of Stroke		
Hemorrhagic stroke	28	28
Ischemic stroke	72	72

Educational Level 42% of stroke patients has only completed elementary school, which is reflective of lower educational attainment being associated with higher stroke risk and poorer health outcomes. Lower educational levels are linked to limited access to healthcare, lower health literacy, and greater exposure to risk factors like hypertension and smoking ([Nurhanifah & Sari,](#)

2022); Iktidar et al., 2024; Vallippalam et al., 2021). This is consistent with findings from Muraleedharan & Chandak, (2023), who note that low education levels contribute to increased vulnerability to stroke

The high percentage (79%) of patients who have received information about stroke suggests that public health campaigns and educational programs have been effective in spreading awareness. However, the finding that 61% have fewer than two sources of information Darehed et al., (2020); Sebastian et al., (2023) indicates that while information dissemination is common, it may not always be comprehensive or diverse. Limited sources of information could hinder patients' ability to fully understand stroke prevention, symptoms, and treatment, which may ultimately delay care-seeking behavior and increase vulnerability to stroke.

A majority (72%) of stroke patients are diagnosed with ischemic stroke, which is consistent with global trends, as ischemic strokes are more common than hemorrhagic strokes. The predominance of ischemic stroke has been reported by multiple studies Iversen et al., (2021); Ranta, (2023), and this is likely influenced by risk factors such as hypertension, diabetes, and atherosclerosis, which are prevalent in the population studied.

Table 2. Characteristics of Stroke Patients in the Emergency Department of of Regional General Hospital in Blitar Regency

Characteristics	n	Percentage (%)
Time of arrival at the ED		
0-3 hours	35	35
3-6 hours	18	18
6-24 hours	26	26
24-48 hours	11	11
>48 hours	9	9
Delay arrival at the ED		
< 3 hours	35	35
≥ 3 hours	65	65
Type of transportation		
Emergency medical service	1	1
Privat car	97	97
Referral ambulance	2	2

The data presented in Table 2, which shows that 26% of stroke patients arrived at the emergency department (ED) 6-24 hours after the attack, indicates a significant delay in seeking medical attention. This delay is particularly concerning because the effectiveness of acute stroke treatments, such as thrombolysis and

mechanical thrombectomy, is highly time-sensitive. As emphasized by Kalkonde et al., (2023) and Pandian et al., (2020), the window for effective intervention in ischemic stroke is narrow. Thrombolytic therapy (tPA) is most effective within the first 3 hours after symptom onset, and mechanical thrombectomy is ideally performed within 6 hours. Delays in seeking care beyond these critical windows result in poorer outcomes, including larger brain infarctions, worse functional recovery, and higher mortality rates.

Based on table 2 the finding that 65% of stroke patients had a delay in arrival to the ED of ≥3 hours further underscore the significant gap in timely stroke treatment. As noted in the literature Jiang et al., (2024); Kim et al., (2023) delays in ED arrival can be associated with worsened outcomes, particularly for ischemic stroke patients who may miss the opportunity for thrombolytic therapy. The risk of ischemic penumbra (tissue that can still be saved with timely treatment) decreases with time, and as the brain tissue becomes irreversibly damaged, the options for treatment become limited.

Type transportation that travels to emergency room 97% use of private vehicles is noteworthy. While using a private vehicle may seem to offer quick transport, it raises concerns regarding stroke management. As noted in research by Iktidar et al., (2024) and Ranta, (2023), relying on private transportation may lead to longer response times in emergency situations. Private vehicles may not provide immediate medical support or enable rapid recognition and management of acute symptoms during transport.

Table 3. Health Seeking Behavior of Stroke Patients' Families in the Emergency Department of of Regional General Hospital in Blitar Regency

Health Seeking Behavior	(n)	(%)
Taken to the emergency room	40	40
Contacting family or clese neighbors	34	34
Taken to a practicing doctor	24	24
Waiting/just leaving it	22	22
Seeking health care the day after attack of stroke	9	9
Take to a traditional healing place	1	1

Based on Table 3, it can be interpreted that 40% of stroke patients were immediately taken to the ED after after the onset of symptoms is a positive finding, indicating that some patients or their families recognize the urgency of stroke and seek prompt medical care. This is crucial because

timely treatment, especially in cases of ischemic stroke, can significantly reduce brain damage and improve outcomes (Kalkonde et al., 2023; Pandian et al., 2020). Immediate transportation to the ED allows for rapid diagnosis and intervention, such as thrombolysis or mechanical thrombectomy, which are most effective when administered within a few hours after symptom onset (Iktidar et al., 2024; Mkhize et al., 2022).

The fact that 34% of patients initially contacted family or close neighbors indicates that many stroke patients, particularly those who are experiencing mild symptoms or may not fully recognize the seriousness of their condition, rely on family members or friends to help them assess the situation. While involving family or close neighbors can be helpful in some cases, this delay in seeking professional medical help can be problematic. The delay could stem from a lack of stroke awareness, especially in rural areas or communities where healthcare access is limited (Pandian et al., 2023). If the family or neighbors do not recognize the severity of the stroke or take too

long to seek medical attention, this could result in a significant delay in treatment, ultimately impacting the patient's recovery and increasing the risk of long-term disability or death (Feigin et al., 2022a; Jiang et al., 2024).

The 24% of stroke patients who were taken to a private practice doctor before going to the ED may reflect a tendency for individuals to seek medical attention from general practitioners (GPs) or family doctors before accessing emergency care. This could be due to a variety of factors, including the availability of private healthcare options, the perceived severity of the symptoms, or a delay in recognizing the urgency of the situation. While seeing a doctor at a private practice may provide some initial evaluation, it is unlikely to offer the specialized care required for stroke management. Stroke is a time-sensitive medical emergency, and delays in getting to the ED, where more advanced interventions are available, could result in worse outcomes (Alkhotani et al., 2022; Ranta, 2023).

Table 4. The Influence of Health-Seeking Behavior and Awareness on Delay in Stroke Patients' Arrival at the Emergency Department of Regional General Hospital in Blitar Regency

Indirect Variable	t	α	Direct Variable	t-	α
Awareness Health – Seeking behavior	12.595	0.000	Health-seeking behavior - Delay	7.292	0.000

Based on Table 4, it can be interpreted that awareness about stroke influences health-seeking behavior, and health-seeking behavior directly affects the delay in patients' arrival at the emergency department. Delay in stroke patients' arrival at the hospital is one of the main obstacles in the management of acute stroke. An important factor that directly affects this delay is health-seeking behavior, which refers to how patients or their families respond to stroke symptoms and seek medical services. This behavior, in turn, is strongly influenced by the level of awareness about stroke. Low awareness of stroke signs and urgency often leads to suboptimal health-seeking behavior, resulting in delays (Kalkonde et al., 2023). Health-seeking behavior reflects the decision-making process of patients or their families in responding to stroke symptoms, which directly affects the time it takes for patients to reach the hospital (Jiang et al., 2024).

Many patients or their families do not immediately seek medical assistance when stroke symptoms appear, such as sudden weakness, speech disturbances, or sudden dizziness. This delay is often caused by the assumption that symptoms will resolve on their own or are not considered an emergency condition (Vallippalam et al., 2021).

Muraleedharan & Chandak, (2023) demonstrated that failure to recognize stroke symptoms or delay in taking medical action is a major factor contributing to delays in patients' arrival at the hospital. Additionally, some patients and their families tend to seek traditional treatments or rely on home remedies before deciding to go to the hospital. This prolongs the critical time required to receive medical intervention. Supported by the study of Kazadi Kabanda et al., (2024) in areas with strong cultural influences, traditional medicine often becomes the first option, delaying access to healthcare facilities.

Poor health-seeking behavior is also reflected in the decision not to use ambulances. Many patients or their families prefer private vehicles or public transportation, which takes longer. Berg et al., (2023) found that patients who did not use ambulances were more likely to experience delays, as other modes of transportation are not designed for emergencies. Moreover, stigma or fear of a serious diagnosis, treatment costs, or previous negative experiences with healthcare services further contribute to delays in arriving at the hospital. Nathisuwan et al., (2022) noted that emotional factors such as fear or anxiety about

medical care can extend delays in seeking treatment.

Awareness about stroke indirectly affects health-seeking behavior, especially in terms of recognizing symptoms, understanding time urgency, and deciding to use appropriate healthcare services. Low awareness reduces the ability of patients or their families to recognize stroke symptoms, understand the urgency, and make appropriate decisions to seek treatment. Low awareness about stroke often leads to patients or families failing to identify stroke symptoms as a medical condition requiring immediate intervention (Cummings et al., 2022). According to Bolatturk, (2023), public education about stroke warning signs, such as using the FAST method (Face drooping, Arm weakness, Speech difficulty, Time to call), can significantly improve early recognition and quick responses to stroke. Patients or their families are also often unaware of the importance of the golden period for stroke treatment (usually 4.5 hours for thrombolysis), making them feel no urgency to seek treatment quickly (Alkhotani et al., 2022). Wanichanon et al., (2024) supported that community education about the optimal time for stroke treatment can reduce delays in patients' arrival at the hospital. By increasing public awareness about stroke and educating them to take the right steps in seeking treatment, delays in arrival can be minimized, thereby improving patients' chances of recovery.

4. Conclusions and Suggestions

This study highlights the significant influence of health-seeking behavior and stroke awareness on delays in emergency care. The findings demonstrate that inadequate awareness and delay in health seeking behavior contribute to prolonged treatment times. To improve outcomes, it is essential to enhance public education on stroke recognition and the importance of immediate medical intervention, along with improving access to emergency services. Further research should explore effective strategies for reducing these delays and improving stroke care.

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