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Knowledge Level of Family about Risk Factor and Early Detection of Stroke Patient at Public Regional Hospital dr. Loekmonohadi Kudus

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ABSTRACT
Stroke is a serious health problem and a leading cause of disability and death, with incidence rates continuing to increase. Families who live with stroke patients often delay treatment because they lack adequate understanding of stroke risk factors and early warning signs. Knowledge of risk factors and symptoms influences the actions that families take before and during transportation to the hospital, as understanding these factors can lead to quicker recognition of a stroke and prompt medical attention. Stroke severity and clinical outcomes can worsen with delayed treatment. Indonesia had 8.3 strokes per 1,000 people in 2023, according to the Indonesian Health Survey. This study examined stroke patients' families' knowledge of risk factors and early stroke symptom detection at RSUD dr. Loekmono Hadi Kudus. This study employed a quantitative descriptive design with a cross-sectional approach. The research was conducted in June 2025 at the Neurology Outpatient Clinic of RSUD dr. Loekmono Hadi Kudus. The study included 490 family members of clinic-treated ischemic and hemorrhagic stroke patients. Researchers used purposive sampling to select 49 respondents. A modified Stroke Recognition Questionnaire (SRQ) was used to collect data, and univariate analysis was used to analyze it. The findings indicated that 53.1% of respondents possessed a moderate understanding of stroke risk factors and the early identification of stroke symptoms, 26.5% exhibited inadequate knowledge, and merely 20.4% demonstrated proficient knowledge. These findings indicate that most families possess basic understanding, but gaps remain in accurate and timely detection.Most families of stroke patients at RSUD dr. Loekmono Hadi Kudus demonstrated a moderate level of knowledge regarding stroke risk factors and early detection of stroke symptoms.

Keywords **:** Early Detection,Family Knowledge,Risk Factors Stroke,Stroke Symptoms.

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INTRODUCTION

Stroke constitutes a serious health problem and a leading cause of disability and mortality, particularly among both productive and older age groups. Hypertension, diabetes, dyslipidemia, advanced age, and lifestyle factors like smoking and obesity are major stroke risk factors in the community. Hypertension, especially stage 2, is the main risk factor for both types of strokes. Ischemic stroke occurs more frequently in individuals aged over 66 years, whereas hemorrhagic stroke occurs more commonly among individuals aged 46–55 years and more frequently affects women (Familah et al., 2024).

According to the World Stroke Organization, in 2022 there were 12,224,551 new stroke cases annually, while 101,474,558 individuals worldwide were living with a history of stroke. In other words, one in four individuals aged 25 years will experience a stroke during their lifetime. Stroke caused 6,552,724 deaths, and 143,232,184 individuals experienced disabilities due to it. From 1990 to 2019, the incidence of stroke increased by 70%, mortality by 43%, and morbidity by 143% in low- and lower-middle-income countries (Feigin et al., 2022). Each year, approximately 13.7 million new stroke cases occur worldwide, and about 5.5 million deaths result from the disease. Approximately 70% of stroke cases and 87% of stroke-related deaths and disabilities occur in low- and middle-income countries. Over the past 15 years, stroke incidence and mortality have been higher in these countries than in high-income countries. Stroke prevalence varies across regions. Strokes affect 7 million Americans (3.0%), while 1.8% of rural Chinese and 9.4% of urban Chinese have them. In China, 19.9% of all deaths are stroke-related, along with Africa and North America (Setiawan, 2022).

The Riset Kesehatan Dasar (Riskesdas) results from Indonesia between 2007 and 2018 show an increasing trend in non-communicable diseases, including stroke. Stroke prevalence increased from 7% in 2013 to 10.9% in 2018. Based on physician diagnoses among Indonesians aged ≥15 years, the prevalence of stroke in 2018 reached 10.9%, which corresponds to an estimated 2,120,362 individuals. The highest prevalence was in East Kalimantan, at 14.7%, and the lowest was in Papua, at 4.1%. Stroke ranked third among diseases with the highest number of cases, totaling 1,789,261. Overall, stroke prevalence in Indonesia has shown a significant increase over time. Indonesia had 8.3 strokes per 1,000 people in 2023, according to the Indonesian Health Survey. Stroke, the third-most expensive disease after heart disease and cancer, cost IDR 5.2 trillion in 2023 (Kemenkes RI, 2022).

Riskesdas 2018 data show that stroke prevalence in Central Java, based on physician diagnosis among individuals aged ≥15 years, reached 11.8% and ranked 13th among Indonesian provinces (Kemenkes RI, 2019). The 2018 Central Java Provincial Riskesdas Report shows that stroke is most common in people aged 75 and older, with a rate of 5.34%. By sex, prevalence among women (1.19%) slightly exceeded that among men (1.17%). By educational level, individuals who had never attended school showed the highest prevalence at 2.95%, followed by those who did not complete primary school (1.97%). By employment status, unemployed individuals demonstrated the highest stroke prevalence at 2.84% (Badan Penelitian dan Pengembangan Kesehatan, 2021).

The study site's medical records show that the number of stroke patients rose from 1,176 in 2023 to 1,234 in 2024. Between January and March 2025, the neurology outpatient clinic recorded 1,469 stroke patients, with an average of approximately 490 per month.

Often, families bring stroke patients to the hospital more than six hours after symptom onset, and some wait one or two days before seeking medical care. Families often delay seeking treatment because they lack adequate knowledge of early stroke symptoms. Limited

awareness of stroke warning signs leads to delayed medical assistance, which can worsen patient outcomes. Many families still demonstrate low or moderate levels of knowledge, which causes them to underestimate early stroke symptoms and delay bringing patients to healthcare facilities.

Approximately 83.9% of delays in stroke management occur because patients arrive late at the hospital. Effective stroke treatment depends on the *golden period*, a critical window of approximately three hours after stroke onset. During the first three hours, patients must receive comprehensive and optimal therapy at the hospital to prevent serious complications. Healthcare providers should treat every stroke quickly. However, many patients experience treatment delays. Delayed treatment can cause disability, cognitive impairment, respiratory issues, and death (Abu & Masahuddin, 2022).

Stroke patients in Indonesia have a 48.5% to 83.9% prehospital delay rate. A Banjarmasin hospital study found that 83.9% of patients experienced prehospital delays due to families' tendency to underestimate symptoms and their lack of stroke detection knowledge (Julianto & Firdaus, 2023). Another study found 48.5% of stroke patients were hospitalized late. Underestimation of stroke symptoms, family ignorance, and distance and transportation barriers contributed. Delays escalate stroke severity, disability, and mortality (Barahama et al., 2019).

Early home management and preventing permanent disability depend on family understanding and attitudes. Stroke constitutes a medical emergency that requires rapid, accurate, and comprehensive treatment. Effective stroke detection requires strong awareness and responsiveness from family members. Appropriate management during the early stage of stroke can reduce the risk of disability by up to 30%. The success of prehospital management largely depends on how well families understand the early signs of stroke. Many people remain unaware or possess limited information about the signs and symptoms of acute stroke, which represents a major cause of delayed treatment after stroke onset. In addition, unsupportive attitudes, inappropriate behaviors, and low educational levels frequently contribute to delays in managing patients with acute stroke (Sari et al., 2019), as these factors can hinder families from seeking timely medical assistance when they observe the early signs of stroke.

The researcher conducted a preliminary survey on February 27, 2025, involving four respondents at RSUD dr. Loekmono Hadi Kudus. The interviews revealed that two families did not recognize the early symptoms of stroke. One family reported feeling panicked when they observed stroke symptoms, whereas another family recognized the symptoms and immediately brought the patient to the hospital. These preliminary findings suggest that stroke patients' families have limited knowledge of stroke symptoms and signs. Risk factors for stroke and emergency conditions requiring immediate treatment are also poorly understood. Such limitations may delay patient management, which can worsen patient outcomes, including morbidity and mortality, by preventing timely interventions that are critical for improving recovery chances and reducing long-term disabilities. Therefore, the researcher conducted a study entitled *"The Description of Family Knowledge Levels Regarding Risk Factors and Early Detection of Stroke Symptoms at RSUD Dr. Loekmono Hadi Kudus."*

METHODS

This study employed a quantitative descriptive design with a cross-sectional approach. Researchers conducted the study at RSUD dr. Loekmono Hadi Kudus' neurology outpatient clinic from June 16 to 21, 2025. The study included families of stroke patients from the previous month, averaging 490 per month. Using a specific sample size formula, the researchers selected 49 families of stroke patients through purposive sampling based on predetermined criteria: family members who lived in the same household as the patient, were older than 18 years, had no cognitive impairment, and were able to communicate effectively.

Researchers used the 30-item Stroke Recognition Questionnaire (SRQ) to assess respondents' knowledge of 13 stroke risk factors and 17 early stroke symptoms. Based on scores, they categorized each response as poor, moderate, or good knowledge. The researchers used frequency distributions and percentages to describe respondents' characteristics and knowledge of stroke risk factors and early stroke symptom detection.

RESULTS

A. Respondent Ages

Table 1. Age Frequency Distribution of Stroke Patient Family Respondents (N=49)

Ages	Frequency	Percentages
19-44	31	63,3
45-59	13	26,5
>60	5	10,2
Total	**49**	**100,0**

The majority of respondents (31; 63.3%) were aged 19–44, followed by 45–59 (13; 26.5%) and older than 60 (10.2%).

B. Respondent Sex Types

Table 2 Sex Type Frequency Distribution of Stroke Patient Family Respondents (N=49)

Sex Types	Frequency	Percentages
Males	18	36,7
Females	31	63,3
Total	**49**	**100,0**

The majority of respondents were women (31; 63.2%), while 18 were men (36.7%).

C. Respondent Education

Table 3. Educational Frequency Distribution of Stroke Patient Family Respondents (N=49)

Educations	Frequency	Percentages
SD-SMP	28	57,1
SMA	18	36,7
PT	3	6,1
Total	49	100,0

Most respondents (28; 57.1%) completed primary or junior high school. Only 3 respondents (6.1%) had graduated from higher education, while 18 (36.7%) had graduated from senior high school.

D. Respondent Occupation

Table 4. Occupation Frequency Distribution of Stroke Patient Family Respondents (N=49)

Occupations	Frequency	Percentages
Entrepreneurs	8	16,3
Labors	18	36,7
Housewives	23	46,9
Total	**49**	**100,0**

Occupational distribution indicated that most respondents were housewives (23 respondents; 46.9%). Workers constituted the second-largest group (18 respondents; 36.7%), followed by self-employed individuals (8 respondents; 16.3%). Thus, housewives represented nearly half of the total respondents in this study.

E. Knowledge

Table 5. Knowledge Frequency Distribution about Risk Factor and Early Detection of Stroke Symptoms (N=49)

Knowledge	Frequency	Percentages
Inadequate	13	26,5
Moderate	26	53,1
Proficient	10	20,4
Total	49	100,0

Most respondents (26; 53.1%) had moderate knowledge of stroke risk factors and early symptoms, followed by inadequate (13; 26.5%) and proficient (10; 20.4%).

DISCUSSION

A. Age characteristics

Among the 49 respondents, 63.3% were aged 19–44 years (31 individuals), 26.5% were aged 45–59 years (13 individuals), and only 10.2% were older than 60 years (5 individuals). These findings indicate that families in young to middle adulthood play a significant role as caregivers or primary decision-makers in the care of stroke patients.

Individuals aged 19–44 years generally fall within the productive age group and tend to demonstrate greater physical, emotional, and cognitive readiness than older adults. Several studies have shown that caregiver age influences the quality of care provided. This finding aligns with Jauhar et al. (2025), who reported a significant relationship between caregiver age and knowledge of home-based stroke care ($p = 0.017$). In the same way, Bekti et al. (2023) found that caregivers between the ages of 18 and 65 were in the productive age group, which is the same age range as in this study. This age range allows caregivers to better meet the needs of those they care for and make decisions that are in their best interests. Overall, the predominance of caregivers in young to middle adulthood emphasizes the need to provide age-appropriate educational and health support strategies, including practical training, psychosocial support, and access to up-to-date information on home-based stroke management.

B. Sex Type Characteristics

The analysis of 49 respondents indicated that most participants were female (31 respondents; 63.2%), while male respondents accounted for 18 individuals (36.7%).

Women play a substantial role as caregivers and decision-makers in families affected by stroke. In Indonesian society, women, especially mothers and wives, are often the ones who make the most important decisions about the health of their families. Women frequently participate in caregiving activities, establishing them as vital sources of health information, particularly regarding stroke. Wati and Yuniarti (2020) observed that in family-oriented stroke care, women play a more prominent role owing to emotional intimacy and socially assigned domestic duties.

C. Educational Characteristics

Most respondents had completed primary or junior high school (28; 57.1%), fewer had completed senior high school (18; 36.7%), and only a small proportion had higher education (3; 6.1%). Educational attainment greatly impacts stroke care management by families.

Lower education levels may hinder families' ability to understand complex health information, including stroke warning signs, and make emergency decisions. Pebriyanti (2017) found a significant relationship between family education and stroke caregiving attitudes in Banyumas. Higher-educated families were more proactive and knowledgeable about stroke care.

Helda et al. (2022) also found that higher-educated families were more resilient to stroke caregiving. Resilience helps families manage stress, follow care protocols, and care for others confidently.

D. Occupational Characteristics

The data show that most respondents worked as housewives (23 respondents; 46.9%). In addition, 18 respondents (36.7%) worked as laborers, and 8 respondents (16.3%) were self-employed. Thus, housewives constituted the dominant occupational group in this study.

Most respondents were women who were crucial to their families, especially as caregivers for stroke victims. These findings show that women are often the main support system for families with health issues. Laborers (36.7%) also helped care for sick family members. However, busy work schedules and limited health information may hinder their knowledge. In contrast, self-employed respondents (16.3%) tended to have greater time flexibility and potentially better access to information, yet they still required adequate education regarding stroke risk factors and early symptom detection.

Notoatmodjo (2018) explains that occupation influences access to information. Individuals employed in certain sectors, such as formal employment, generally obtain health information more easily through workplace facilities, health insurance, or health education seminars.

Sari et al. (2023) reported a significant relationship between occupation and knowledge levels regarding early stroke detection. Individuals who were unemployed or had lower educational attainment tended to demonstrate lower knowledge levels due to limited access to accurate and reliable health information.

E. Knowledge Categories

The findings indicate that most respondents demonstrated a moderate level of knowledge (53.1%) regarding stroke risk factors and symptoms. This result suggests that

most families possess basic understanding but lack optimal ability to recognize early stroke symptoms quickly and accurately. Meanwhile, 26.5% of respondents remained in the low-knowledge category, indicating an urgent need for family-centered health education. Only 20.4% of respondents demonstrated good knowledge, indicating that most families are inadequately prepared to respond to stroke events promptly and appropriately.

The study found that family knowledge of stroke risk factors was low. Many respondents answered risk-factor questionnaire questions incorrectly. 37 respondents (75.5%) misidentified iron deficiency as a stroke risk factor, 33 (67.3%) misidentified sleep disturbances, 30 (61.2%) misidentified family history of stroke, 21 (42.9%) misidentified inability to strain, and 19 (38.8%) misidentified diabetes. Rosemary et al. (2019) also found poor family knowledge of stroke risk factors. In that study, many respondents misidentified family history of stroke (87%), sleep difficulty (60; 77.9%), and iron deficiency (58) as stroke risk factors.

These results demonstrate widespread misconceptions among the public regarding stroke risk factors. A total of 37 respondents (75.5%) incorrectly identified iron deficiency as a stroke risk factor, whereas stroke risk primarily associates with cardiovascular disorders such as hypertension, diabetes mellitus, and dyslipidemia (Sari et al., 2021). Hypertension represents the most dominant risk factor, as it damages cerebral blood vessels and triggers ischemic or hemorrhagic stroke (Wulandari & Nuraini, 2020). Diabetes increases stroke risk through metabolic disturbances and vascular damage (Putri et al., 2019).

Although iron deficiency contributes to health conditions such as anemia, it does not constitute a directly established risk factor for stroke. Iron-deficiency anemia more commonly relates to systemic tissue oxygenation disorders rather than directly causing cerebral thrombosis or vascular rupture (Fitriani et al., 2022).

Family knowledge of early stroke warning signs also remained limited. Many respondents answered incorrectly on items related to early stroke symptoms. For example, 41 respondents (83.7%) incorrectly identified sudden pain in one arm as a stroke symptom. Furthermore, 26 respondents (53.1%) answered incorrectly regarding shortness of breath, 23 respondents (46.9%) regarding chest burning sensation, 23 respondents (46.9%) regarding illegible or blurred handwriting, and 23 respondents (46.9%) regarding difficulty swallowing. These findings align with Rosmary et al. (2019), who reported insufficient family knowledge of early stroke symptoms. In that study, 63 respondents (81.8%) incorrectly identified unilateral arm pain as a stroke symptom, 59 respondents (76.6%) reported thinking disturbances, 56 respondents (72.7%) reported breathing difficulty, and 56 respondents (72.7%) reported sensations of heat.

Syahputri and Andika (2022) demonstrated that such misperceptions hinder early stroke detection because families fail to recognize stroke symptoms. Sudden stroke signs include weakness on one side of the face, arm, or leg, as well as difficulty speaking or understanding speech. Other symptoms, such as changes in handwriting (46.9%) and difficulty swallowing (46.9%), remain poorly recognized by the general population, despite indicating neurological impairment caused by stroke (Wibowo et al., 2020).

Families often experience limited understanding due to restricted access to stroke-related information. Families may obtain information on stroke risk factors, symptoms, and initial management through healthcare professionals, social media, and mass media. However, these sources frequently fail to provide adequate knowledge regarding stroke warning signs and appropriate first-aid responses. Therefore, improving family knowledge

of stroke risk factors and early detection remains essential in Indonesia, and healthcare professionals must actively deliver accurate and practical information (Handayani, 2019).

This study found that higher education respondents with moderate knowledge scores may have faced environmental constraints during questionnaire completion. Noise and crowding may have reduced concentration and response accuracy. These external factors may have influenced respondents' scores and misrepresented their knowledge and skills.

These findings align with Sari et al. (2023) at RSUD Kota Bukittinggi, where 35 respondents (46.7%) demonstrated moderate knowledge. This result indicates that family understanding of early stroke detection remains insufficient to support rapid emergency responses. Maratning et al. (2021) at RSUD H. Boejasin Pelaihari also reported that most respondents (53.34%) demonstrated low knowledge of stroke risk factors, while knowledge of early stroke symptoms predominantly fell within the moderate category (50%).

Nento et al. (2023) at RSUD Prof. dr. Aloei Saboe further reinforced these findings, showing that although 67.2% of respondents demonstrated moderate knowledge, 61.2% still performed inadequate initial stroke management. This finding highlights that moderate knowledge does not necessarily translate into appropriate or effective action.

Most respondents had moderate knowledge across these studies. This suggests that families recognize common stroke symptoms but lack stroke risk factor knowledge and emergency preparedness. Moderate knowledge is insufficient for emergency decision-making or action. At the national level, stroke management theory and practice differ. Continuous education, hands-on training, and public awareness of rapid response during the golden period are needed to close this gap. We need practical and application-oriented educational interventions to enhance stroke management at the family level.

CONCLUSION

The research results from 49 stroke patient families at Public Regional Hospital dr. Loekmono Hadi Kudus, related to the risk factor and early detection of stroke symptoms, found most families had moderate knowledge, 53.1%. On the other hand, 26.5% respondents had inadequate knowledge and only 20.4% respondents were proficient. These research results recommend:

1. For the hospital:
   Families of stroke patients should receive regular health education sessions, brochures, social media, and direct consultations from healthcare providers about stroke risk factors and early symptoms. In addition, healthcare institutions should strengthen collaboration with nurses and physicians in the neurology outpatient clinic to provide brief educational interventions during patient visits. Healthcare providers may also create educational videos for display on waiting room televisions, serving as an effective method of educating patients and their families.
2. For the patient families:
   Families must actively pursue information regarding stroke warning signs and risk factors from credible sources and should not disregard early symptoms when they manifest. Families require fundamental first-aid competencies and explicit instructions for prompt referral to healthcare facilities upon the onset of stroke symptoms.
3. For future researchers:

Instead of outpatient clinics, researchers should use inpatient wards for data collection. In outpatient clinics, respondents' time constraints, limited focus, and environmental distractions make questionnaire completion difficult. Inpatient research may allow respondents to stay calmer and have more time, allowing them to provide more accurate and in-depth responses about stroke risk factors and early symptom detection.

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