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KNOWLEDGE, ATTITUDES, AND PRACTICES OF THE DEPOK COMMUNITY TOWARDS STROKE

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ABSTRACT

Introduction: Stroke is the number one cause of disability and the number two cause of death in the world. Stroke is also the ninth cause of death in hospitals in Depok. Prehospital delays contribute greatly to poor stroke management.
Objective: Therefore, the knowledge, attitudes, and behavior of the Depok community towards stroke need to be assessed to find out the causes of pre-hospital delays.
Material and methods: This research uses descriptive design with a cross-sectional approach. The sampling technique used consecutive sampling techniques. Data was obtained using a questionnaire consisting of 12 knowledge component questions, 4 attitude component questions, and 3 behavior component questions.
Result: Of the 400 respondents representing the people of Depok, 82.5% have poor knowledge about stroke. A total of 60.75% of the people of Depok have a poor attitude toward stroke, and 56.25% of the people of Depok exhibit poor behavior towards stroke.
Discussion: This study found that most Depok residents have suboptimal knowledge, attitudes, and practices related to stroke, particularly regarding emergency response, treatment, and rehabilitation. Awareness of risk factors was relatively high, but recognition of stroke symptoms and appropriate actions remained limited. Sociodemographic variables—including age, education, income, and district of residence—were significantly associated with knowledge and behavior. Younger participants, those with higher education and income levels, and residents of urban districts tended to demonstrate better awareness and attitudes. Although women showed higher awareness scores, this was not consistently reflected in preventive practices. This study's limitations include reliance on self-reported data, lack of representation for populations without internet access, and the absence of analysis on the interrelationship between knowledge, attitudes, and behaviors.
Conclusion: The result shows that the majority of the people of Depok have inadequate knowledge, attitudes, and behaviors regarding stroke.

Keywords: attitude; depok; knowledge; practice; stroke

INTRODUCTION

Stroke has emerged as a global health epidemic, with more than 12.2 million new cases reported annually and an estimated 6.5 million deaths attributed to stroke worldwide in 2019.[1] In Asia, Japan and Singapore exhibit the lowest stroke mortality rates, with 43.3 and 47.9 deaths per 100,000 individuals, respectively. In contrast, Indonesia has the highest stroke-related mortality and incidence rates in Asia, with 193.3 cases per 100,000 individuals recorded in 2021.

Stroke remains the leading cause of death in Indonesia. According to the 2018 Riskesdas (Indonesian Health Survey), the prevalence of stroke in the country is 10.9 cases per 1,000 individuals, affecting approximately 2.12 million people. Data from the 2021 health profile of Depok City indicates that stroke ranked as the 16th most common cause of hospitalization, with 271 new cases and 690 hospital visits. Furthermore, stroke was the 9th leading cause of death in Depok hospitals in 2021, resulting in 64 fatalities. By 2023, stroke had fallen to the 11th leading cause of death, although the absolute number of deaths increased to 141.[2-5]

A significant proportion (83.9%) of stroke-related delays in treatment can be attributed to pre-hospital delays, with 62.3% of these delays resulting from insufficient awareness of stroke risk factors and symptoms among patients and their families. Despite stroke being the leading cause of disability and the second most common cause of death worldwide, approximately 90% of stroke cases are preventable through effective risk factor management and early detection. Consequently, reducing the burden of stroke requires comprehensive healthcare strategies beginning with prevention. In addition to knowledge, previous research has highlighted that public attitudes and behaviors regarding stroke are suboptimal, which may contribute to the high incidence and mortality rates. However, no studies to date have comprehensively assessed the levels of knowledge, attitudes, and behaviors toward stroke in Depok. This study aims to fill this gap by evaluating the awareness, attitudes, and behaviors of Depok's population regarding stroke.[6,7]

MATERIAL AND METHODS

This cross-sectional observational study was conducted among the residents of Depok, West Java, between July and September 2024. Ethical approval for the study was granted by the Ethics Committee of the Faculty of Medicine, University of Indonesia – Dr. Cipto Mangunkusumo General Hospital (FKUI-RSCM), under protocol number KET-1322/UN2.F1/ETIK/PPM.00.02/2023. The study was carried out in collaboration with the Depok City Health Office, which assisted in the

sampling process. A consecutive sampling technique was employed, and the minimum sample size was calculated using Slovin's formula, yielding a required sample of 399 individuals. The study population consisted of Depok residents who were fluent in Bahasa Indonesia and capable of using electronic devices to complete an online questionnaire.

The instrument used for data collection was a modified version of a previously validated questionnaire designed to assess knowledge, attitudes, and behaviors regarding stroke, as used in a similar study conducted in Kolkata, West Bengal, India. To ensure the validity and reliability of the adapted questionnaire, a pilot test was conducted with 42 participants. The validity of the questionnaire was assessed through Pearson's bivariate analysis, with results indicating that all items were valid ($p < 0.05$) for measuring the respective components of knowledge, attitudes, and behaviors. Reliability was evaluated using Cronbach's alpha, with values exceeding 0.6 for each component, demonstrating satisfactory internal consistency for the instrument.

The questionnaire comprised four main sections: (1) demographic information, (2) knowledge about stroke, (3) attitudes toward stroke, and (4) behaviors related to stroke. Demographic data collected included age, gender, education level, and district of residence. The knowledge section consisted of 12 questions addressing various aspects of stroke, such as its symptoms, risk factors, treatment options, and related facts. The attitudes section included 4 questions assessing respondents' attitudes toward stroke, while the behavior section contained 3 questions evaluating their behaviors in response to stroke. The responses were scored, and the total score was categorized into three levels: "Good" (76%-100%), "Moderate" (56%-75%), and "Poor" (0%-55%).

RESULTS

Based on Table 1, the most common age range among respondents was between 26-40 years, comprising 199 individuals (49.8%). The majority of respondents were female, with 253 individuals (63.2%). Most respondents were from Beji District, with 77 individuals (19.3%). Regarding the highest level of

education, the majority had completed secondary school, with 262 individuals (65.5%).

Table 1. Respondents' Characteristics

Characteristic	n(%)
Age (years)	
<26	131 (32,8)
26-40	199 (49,8)
>40	70 (17,5)
Gender	
Male	147 (36,8)
Female	253 (63,2)
District of Residence	
Beji	77 (19,3)
Bojongsari	23 (5,8)
Cilodong	27 (6,8)
Cimanggis	43 (10,8)
Cinere	38 (9,8)
Cipayung	42 (10,5)
Limo	25 (6,3)
Pancoran Mas	39 (9,8)
Sawangan	33 (8,3)
Sukmajaya	40 (10,0)
Tapos	12 (3,0)
Education Level	
Did not complete elementary school/completed elementary school	48 (12,0)
Completed secondary school	262 (65,5)
Completed higher education	90 (22,5)

Based on Table 2, the majority of Depok residents exhibited insufficient knowledge about stroke, with 330 individuals (82.5%) falling into the "poor knowledge" category. Only 18 individuals were classified as having "good" knowledge, while 52 individuals had "moderate" knowledge about stroke. The prevailing attitude toward stroke among Depok residents was also largely negative, with 243 individuals (60.75%) showing poor attitudes toward stroke. Meanwhile, 36 individuals had a positive attitude, and 121 individuals showed a moderate attitude. Regarding behavior, the majority exhibited poor behavior toward stroke, with 185 individuals (46.25%) in this category. A total of 87 individuals demonstrated good behavior, and 128

individuals showed moderate behavior regarding stroke.

Table 2. Level of Knowledge, Attitudes, and Practices of the Depok Community Toward Stroke

Characteristic	n(%)
Knowledge	
Good	18 (4,5)
Moderate	52 (13,0)
Poor	330 (82,5)
Attitude	
Good	36 (9,0)
Moderate	121(30,25)
Poor	243 (60,75)
Practices	
Good	87(21,75)
Moderate	128(32,0)
Poor	185(46,25)

The categorization of data was further analyzed with a comparison test using respondent characteristics. A Chi-square test was used to assess the significance of the data, provided that no cell in the contingency table had an expected frequency of less than 1. In cases where this criterion was not met, Fisher's Exact Test was employed. A p-value < 0.05 indicated a statistically significant relationship between the two variables at the 5% significance level.

The highest proportion of respondents with good knowledge of stroke was found among those under 26 years old (10 individuals, 2.5%), male respondents (10 individuals, 2.5%), and those with a college education (9 individuals, 2.3%). Age and education level were found to have a statistically significant relationship with knowledge, with p-values of 0.001 and 0.000, respectively (Table 3).

Table 3. Distribution of Knowledge Categories Based on Respondent Characteristics

Variable		Knowledge			p-value
		Poor n(%)	Moderate n(%)	Good n(%)	
Age (years)	<26	86(21,5)	35(8,8)	10(2,5)	0,001
	26-40	188(47,0)	8(2,0)	3(0,8)	
	>40	56(14,0)	9(2,3)	5(1,3)	
Gender	Male	124(31,0)	13(3,3)	10(2,5)	0,052
	Female	206(51,5)	39(9,8)	8(2,0)	
Level of Education	Did not complete elementary school/completed elementary school	47(11,8)	0(0,0)	1(0,3)	0,000
	Completed secondary school	229(57,3)	25(6,3)	8(2,0)	
	Completed higher education	54(13,5)	27(6,8)	9(2,3)	

The largest proportion of respondents with a positive attitude toward stroke was found among those under 26 years old (25 individuals, 6.3%), female respondents (23 individuals, 5.8%), and those with a secondary school education (22 individuals, 5.5%). Both age and education level showed a statistically significant relationship with attitude, with p-values of 0.000 (Table 4).

Table 4. Distribution of Attitude Categories Based on Respondent Characteristics

Variable		Attitude			p-value
		Poor n(%)	Moderate n(%)	Good n(%)	
Age (years)	<26	53(13,3)	53(13,3)	25(6,3)	0,000
	26-40	156(39,0)	40(10,0)	3(0,8)	
	>40	34(8,5)	28(7,0)	8(2,0)	
Gender	Male	99(24,8)	35(8,8)	13(3,3)	0,088
	Female	144(36,0)	86(21,5)	23(5,8)	
Level of Education	Did not complete elementary school/completed elementary school	43(10,8)	5(1,3)	0(0,0)	0,000
	Completed secondary school	177(44,3)	63(15,8)	22(5,5)	
	Completed higher education	23(5,8)	53(13,3)	14(3,5)	

In terms of behavior, the highest proportion of respondents demonstrating good behavior toward stroke were those under 26 years old (56 individuals, 14.0%), female respondents (59 individuals, 14.8%), and those with secondary school education (47 individuals, 11.8%). Statistically significant relationships between age and education level with behavior were also found, with p-values of 0.000 for both variables (Table 5).

Table 5. Distribution of Behavior Categories Based on Respondent Characteristics

Variable		Practices			p-value
		Poor n(%)	Moderate n(%)	Good n(%)	
Age (years)	<26	27(6,8)	48(12,0)	56(14,0)	0,000
	26-40	133(33,3)	54(13,5)	12(3,0)	
	>40	25(6,3)	26(6,5)	19(4,8)	
Gender	Male	73(18,3)	46(11,5)	28(7,0)	0,496
	Female	112(28,0)	82(20,5)	59(14,8)	
Level of Education	Did not complete elementary school/completed elementary school	33(8,3)	13(3,3)	2(0,5)	0,000
	Completed secondary school	141(35,3)	74(18,5)	47(11,8)	
	Completed higher education	11(2,8)	41(10,3)	38(9,5)	

DISCUSSION

As shown in Table 2, 330 respondents (82.5%) exhibited poor knowledge of stroke, while 52 individuals (13%) demonstrated moderate knowledge, and only 18 individuals (4.5%) showed good knowledge. It was found that the younger population, particularly those under 26 years old, had better knowledge about stroke, likely due to greater exposure to social media compared to older age groups. A survey on online behavior and media consumption revealed that the majority of individuals aged 18-24 spent 1-6 hours on social media daily, with 22% of them using it to acquire new information. The study did not identify gender as a significant factor affecting knowledge about stroke. Furthermore, it was found that individuals with higher education

levels were more likely to have better knowledge of stroke. This can be attributed to the fact that individuals with higher education typically have better access to credible health information through academic programs, online resources, and professional networks. Access to such information allows individuals with higher education to stay updated on the latest guidelines and recommendations for stroke prevention and management. Moreover, education enhances cognitive abilities and analytical skills, enabling individuals to better understand complex stroke-related concepts, which may be challenging for those with lower educational levels.[8,9]

In terms of stroke prevention, Depok residents demonstrated relatively good knowledge about stroke symptoms and risk factors. However, their knowledge about stroke management and post-stroke care remained inadequate. This was reflected by the large number of respondents who did not correctly answer questions regarding the "golden period" for stroke and stroke treatment. The authors hypothesize that this gap may be due to health promotion materials primarily focusing on prevention and early intervention, with less emphasis on stroke management and emergency care. Information on stroke treatment is often disseminated in secondary or tertiary healthcare settings, limiting its reach to the general population.[10]

Regarding attitudes, Table 2 shows that most Depok residents exhibited poor attitudes toward stroke. Although many respondents believed that stroke patients could return to work and held positive views on stroke prevention, a significant number still believed prevention efforts should occur only after a stroke. The highest proportion of individuals with good attitudes toward stroke were found in the under-26 age group, among females, and those with secondary education. This contrasts with previous studies in West and East Java, which found that attitudes improved with higher levels of education. Younger individuals tend to be more proactive in managing their health, leveraging social media to access health information, which likely boosts awareness and attitudes toward

stroke. Additionally, women are generally more sensitive to health issues, possibly due to cultural roles as caregivers, making them more likely to exhibit positive attitudes toward health management. Studies have shown that women are more likely to trust healthcare recommendations compared to men, which may explain their more favorable attitudes toward stroke prevention and care.[11,12]

Regarding behavior, most respondents demonstrated inadequate behavior in dealing with stroke. While a large proportion of respondents correctly identified emergency behaviors, such as taking patients to the hospital or contacting medical assistance, some respondents were unaware of proper emergency response actions for stroke. Factors influencing the decision to seek medical help include stroke severity, understanding of symptoms, motivation to seek help, and fear of stroke consequences. The lack of knowledge and poor attitudes toward stroke contributed to inadequate emergency responses, with some respondents allowing stroke patients to recover on their own without seeking professional help.

Despite this, the study found that many respondents emphasized stroke prevention over treatment. Since the knowledge of stroke prevention was relatively good, it can be expected that behavioral practices related to prevention would also be good. The most common form of treatment chosen by Depok residents was physiotherapy, which is often associated with post-stroke rehabilitation. However, there is limited awareness of the broader range of treatments required for stroke recovery. Physiotherapy, while important for motor recovery, is just one aspect of post-stroke care, and comprehensive treatment, including emergency care, ongoing medical treatment, and rehabilitation, is essential for full recovery.

Younger individuals (under 26 years old) exhibited the best behavior towards stroke. This can be attributed to their more proactive approach to health management, likely due to their greater familiarity with health technologies and information. Moreover, females showed better

behavior toward stroke, consistent with their more positive attitudes. Those with secondary education also demonstrated better behavior, although this contrasts with previous studies that found behavior to improve with higher educational attainment. This discrepancy might be explained by the fact that groups with better attitudes toward stroke are more likely to engage in preventive measures and take appropriate action in the event of a stroke.[12-14]

Finally, when comparing the results of this study with similar research in West and East Java, the general trends in knowledge, attitude, and behavior were similar. In both studies, the population's levels of knowledge, attitude, and behavior were relatively poor. However, a study conducted in 2022 in West and East Java found that 51% of respondents had low knowledge, 67% had poor attitudes, and 48% exhibited poor behavior. In contrast, a study conducted among students at Andalas University in 2013 revealed more positive results, with 52.9% of respondents demonstrating adequate knowledge, 77.6% showing positive attitudes, and 75.3% displaying good behavior. The differences in these findings suggest that a more specific demographic, such as university students, may exhibit better knowledge, attitudes, and behaviors compared to the broader population.[11,15]

This study has several limitations. The self-reported nature of the data means that actual behaviors may not fully align with reported behaviors, as respondents may provide socially desirable responses. Additionally, the results are not representative of Depok's population without access to mobile devices or the internet. Furthermore, the study did not assess the relationships between the individual variables of knowledge, attitude, and behavior.

CONCLUSION

The majority of the population in Depok has poor knowledge, attitudes, and behaviors regarding stroke.

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