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by Nur Ainiyah

Original Articles

Family Knowledge on Prehospital Stroke Detection Correlates with Hospital Arrival Time in Stroke Patients at The Naval Hospital Dr. Ramelan, Surabaya

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Abstract

Background: Successful stroke management depends on the speed, accuracy, and timeliness of the initial treatment. Stroke patients with immediate medical help can minimize permanent disability and even mortality.

Objective: This study analyzes the correlation between family knowledge on prehospital stroke detection with hospital arrival time.

Method: The research design was correlational analytic with a cross-sectional approach. This paper was conducted at the Naval Hospital Dr.Ramelan, Surabaya, from January to February 2019, with ethical clearance from the hospital. The independent variable was family knowledge on prehospital stroke detection, and the dependent variable was hospital arrival time. There were 115 population and 111 samples by consecutive sampling technique. The instrument to measure family knowledge was a questionnaire about prehospital stroke detection consisted of 30 items, while to evaluate hospital arrival time was data from the medical record. The data analysis used the Mann-Whitney statistical test with a significance of 0.05.

Result: Most respondents had adequate knowledge regarding prehospital stroke detection (54.1%) and early hospital arrival time (59.5%). There was a correlation between family knowledge on prehospital stroke detection and hospital arrival time in stroke patients (p=0.000).

Conclusion: The better family knowledge on prehospital stroke detection, the faster hospital time arrival. Health workers should give health education on prehospital stroke detection to prevent delayed hospital arrival. Further research could involve electronic and social media to improve knowledge on prehospital stroke detection.

INTRODUCTION

Cerebro Vascular Accident (CVA) attack incidence reaching up to 24.9% of the global population. It is a severe health problem because it can cause physical and mental disability, even mortality. A stroke is a neurological change caused by a disturbance in the blood supply to the brain (Black, 2014). World Health Organization (WHO) defines stroke as a clinical sign that develops rapidly due to focal or global brain disorder with symptoms lasting 24 hours or more and leading to death without any apparent cause other than vascular(Kabi et al., 2015). Successful stroke management relies on the speed and accuracy of prompt treatment, in the attempt to mitigate the patients from extensive brain damage. However, in most cases, patients were late admitted to the hospital (more than 3 hours following the stroke). One of the crucial keys to prevent premature deaths and brain damages are to immediately accessing proper treatments (Fassbender et al., 2013).

The WHO (2018) stated that stroke was the second leading cause of death in the world (6.15 million deaths per year or 10.8%) after heart disease (7.25 million deaths per year or 12.8%). The estimation from 785,000 individuals with stroke, 600,000 had first attacks, 185,000 had recurrent attacks with a mortality rate of 150,000 (Go et al., 2014). Ministry of Health Republic of Indonesia (2013) estimated that the number of individuals with stroke in Indonesia - based on the health workers' diagnosis - was 2,137,941 people (12.1%). Meanwhile, their number in East Java Province was 302,987 people (10.5%). Data at the Naval Hospital Dr. Ramelan, Surabaya Pavilion VII (Neural Ward) showed the total number of stroke patients in 2017 was 474 patients consisting of 159 men and 315 women. Of all patients 81.85% had an ischemic stroke, and 18.15% had a hemorrhagic stroke. A preliminary study at Pavilion VII Naval Hospital Dr. Ramelan Surabaya showed that 5 out of 7 patients were late admitted due to lack of family knowledge of signs and symptoms.

Late prehospital treatment is common. Previous research reported that families brought patients to the hospital more than 3 hours after onset by private transportation. Lack of knowledge and decision-making skills, and financial hardships are amongst the major determinants of the late hospital administration(Pitthayapong et al., 2017). In addition, a study revealed the causes of delayed hospital arrival were ignoring the early signs of stroke (62.3%) and hoping the symptoms and signs will disappear by themselves (2.7%). In addition, patients who live alone (7.1%) and far from health facilities contributed to the delay. Moreover, transportation facilities' absence also became the barrier(Al Khathaami et al., 2018).

Stroke sufferers experience sudden (acute) neurological changes due to occlusion or hypoperfusion in the brain blood vessels. If not treated immediately, death cell will occur within a few minutes (Kuriakose & Xiao, 2020). Ischemia occurs when blood flow is less than 20 mL/100 grams per minute. Complete cessation of blood flow to brain tissue for 15-20 seconds causes loss of consciousness. Furthermore, irreversible damage will occur within 7-10 minutes (Vilela & Rowley, 2017). The impact is the disability, including physical, cognitive, and emotional deficits. The longer

the delay in stroke management causes brain tissue to suffer permanent damage so that the impact is more severe and difficult to recover (Kim et al., 2011).

Efforts to prevent delays in the golden period are early detection of stroke in prehospital patients. The method of detecting stroke in the general public is the FAST method. It is one of the easiest identifications to recognize the early signs and symptoms of stroke (Lima et al., 2016). FAST stands for Face, Arms, Speech, Time – it can be assessed from facial symmetry, arm paralysis, and speech difficulties. When the family recognizes such warning signs in the patient, they should come to the hospital immediately. It can increase family awareness of the early signs of a stroke. This study analyzes the correlation between family knowledge regarding prehospital stroke detection with hospital arrival time at Naval Hospital Dr. Ramelan, Surabaya.

METHODS

Study Design

This study used a cross-sectional approach, to determine the relationship between the levels of family knowledge about the detection of prehospital stroke with the speed of bringing to the hospital.

Settings

This study was conducted at the Naval Hospital Dr.Ramelan, Surabaya on December to January 2019

Research subject

A total of 111 samples were involved consecutively with the inclusion criteria: A family who could provide information on the incidence of stroke, able to read and write, and was willing to be respondents. And exclusion criteria: the patient's family who did not live at home. The independent variable was family knowledge on prehospital stroke detection, and the dependent variable was hospital arrival time

Instruments

The instrument for the level of family knowledge about early detection of prehospital stroke was a questionnaire sheet in the form of a checklist. The questionnaire consists of 8 prehospital stroke detection statements which include face movement, arm movement, speech and time. Each of these criteria consists of 2 statements. While the instrument for the speed of bringing to the hospital is a questionnaire sheet in the form of open questions consisting of 4 questions including the time of having a stroke, the time of bringing to the hospital, the time to arrive at the hospital and the reason for being late to the hospital.

Data collection

The researcher distributed a questionnaire about the level of family knowledge and a questionnaire about the speed of providing hospitals to respondents and asked respondents to fill out the questionnaire sheet after the researcher explained how to fill out the questionnaire.

Data Analysis

The data analysis used the Mann-Whitney statistical test with a significance of 0.05. If A $\rho < \alpha$, indicated the correlation between family knowledge on prehospital stroke detection and hospital arrival time.

Ethical Consideration

This study's ethics was approved by the Institutional review board of the Hospital under the clearance number 04/EC/KERS/2019.

RESULTS

Table 1 Distribution of respondents by age, gender, educational levels, and profession.

Characteristics of Respondents	Frequency	n (%)
Age		
17-25 years old (late adolescence)	15	13.5
26-35 years old (early adulthood)	12	10.8
36-45 years old (late adulthood)	33	29.7
46-55 years old (early elderly)	24	21.6
56-65 years old (late elderly)	27	24.3
Gender		
Male	42	37.8
Female	69	62.2
Educational Level		
Elementary (Elementary School - Junior High School)	27	24.3
Middle School (High School)	51	45.9
University (College)	33	29.7
Profession		
Unemployment	51	45.9
entrepreneur	24	21.6
private employees	24	21.6
Indonesian National Armed Forces/Police of the Republic of Indonesia/civil servants	12	10.5
Total	111	100

Table 1 shows that most respondents were at their 36-45 late adulthood (29.7%), female (62.2%), and unemployed (45.9%). They graduated from middle school (45.9%).

Table 2 Family knowledge on prehospital stroke detection, hospital arrival time, and reasons for delayed hospital arrival time

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Variables	Frequency	n (%)
Family knowledge on prehospital stroke detection		
Good	30	27
Adequate	60	54.1
Inadequate	21	18.9
Hospital arrival time.		
Early (≤3 hours after onset of stroke)	66	59.5
Late (> 3 hours after onset of stroke)	45	40.5
Reasons for late hospital arrival time		
Lack of understanding of the stroke signs	18	40
Afraid of expensive hospital cost	6	13.3
Waiting for family decision	6	13.3
Misinterpretation as a gout signs	3	6.7
Unresponsive to stroke signs	6	13.3
No transportation	6	13.3

Table 2 indicates that most respondents have adequate family knowledge on prehospital stroke detection (54.1%) and early hospital arrival (59.5%). However, the most reason for late hospital arrival time is a lack of understanding of the stroke signs (40%).

Table 3 Cross-tabulation between Family knowledge on prehospital stroke detection and hospital arrival time

Family knowledge on prehospital stroke detection	Hospital arrival time				Total		ρ
	Early (≤3 hours)		Late (>3hours)				
	n	%	n	%	n	%	
Good	30	100	0	0	30	100	
Adequate	36	60	24	40	60	100	0.000
Inadequate	0	0	21	100	21	100	
Total	66	59.5	45	40.5	111	100	

Table 3 represents that of 60 respondents with adequate family knowledge on prehospital stroke detection, most of them (60%) have early hospital arrival. Meanwhile, of the 21 respondents with inadequate family knowledge, all (100%) have late hospital arrival. The Mann-Whitney analysis result is 0.000 (p<0.05), which indicates the correlation between family knowledge on prehospital stroke detection and hospital arrival time.

DISCUSSION

Most respondents had adequate family knowledge on prehospital stroke detection (table 2). Questionnaire analysis showed that most of them understand the early detection of facial (66%), arm (63.5%), and time (63.5%). Almost all of them (89.2%) were responsive to speech difficulties signs. The highest level of family knowledge was speech detection, while the lowest was arm and time detection. Respondents answered according to their experience. Not all respondents know about early detection on arm and time because of the lack of participation of health workers in conveying

information about prehospital stroke detection. In addition, there is little information about stroke in both electronic and print media. As a result, families are less aware of stroke attacks and result in late hospital arrival. Families play an essential role in handling and making decisions in health care when a stroke occurs.

Individuals with a stroke must have immediate treatment to minimize permanent disability and even death. So, education about prehospital stroke detection is essential. It is in line with Notoatmodjo's (2012) theory, which states that knowledge results from knowing. It happens after people have sensed a specific object. Sensing objects occurs through the five human senses: sight, hearing, smell, taste, and touch. In addition, most of the human knowledge is obtained through the eyes and ears. Perceptual attention to objects influences the sensing process and knowledge production.

One of the factors that affect knowledge is age. Nearly half of the respondents were 36 to 45 years old (table 1). In the psychological aspect, individuals in late adulthood have better-thinking skills in dealing with problems. They have a better understanding of information. The older one gets, the more one's mindset develops so that the knowledge gained will improve and increase (Rachmawati et al., 2017). Educational level is a predisposing factor of knowledge. Almost half of the respondents graduated from middle school (table 1). Education is crucial in problem-solving. It affects behaviour, especially in the health aspect. In addition, educational level is an indicator of academic level. It involves the ability to process information so that individuals with higher educational levels have better knowledge. Furthermore, the higher the education, the faster receiving and understanding of data. As a result, it can increase comprehension (Farrag et al., 2018).

Knowledge is also affected by work. Almost half of the respondents were unemployed (table 1). Employment individuals get more sources of information - from colleagues and technology in the work environment - more than those who do not work. Meanwhile, unemployed individuals are less social, causing a lack of information and knowledge. The work environment creates a source of knowledge because of exchanging information between colleagues (Pitthayapong et al., 2017).

Most respondents had early hospital arrival (table 2). Hospital arrival time in stroke patients is crucial to avoid permanent disability and even death. A study reported that the golden hours in stroke treatment is ± 3 hours (Advani et al., 2017). Three hours after the stroke onset, the patient should immediately receive comprehensive and optimal therapy from the hospital emergency team. Delay in stroke treatment results in paralysis and cognitive impairment. Furthermore, the damage is permanent. Prompt treatment of stroke can reduce the incidence of physical disability due to stroke.

A small proportion of families were not aware of the sign of a stroke (table 2). They considered the signs of a stroke – a dropping jaw, weakness in the arm or leg, or difficulty speaking – as not severe and do not need immediate treatment. They believed the signs would disappear a few hours later, so the family did not seek medical help even though the conditions were early stroke signs. A stroke can be preceded by a transient ischemic attack (TIA) or a minor stroke. It is a sudden and brief

attack of neurologic deficit due to focal brain ischemia. It tends to improve within 24 hours – usually, it lasts 2 to 30 minutes and rarely lasts more than 1 to 2 hours. The cause is partial or complete occlusion from acute thromboembolism or stenosis of a blood vessel. Individuals with sudden symptoms similar to the signs of a stroke should seek medical help immediately(Abbott et al., 2017).

The finding in this study indicates a significant correlation between family knowledge on prehospital stroke detection and hospital arrival time. Most respondents with adequate knowledge on prehospital stroke detection had early hospital arrival. Meanwhile, all respondents with inadequate knowledge had late hospital arrival (table 3). It indicates that knowledge is one crucial factor that affects hospital arrival time after the onset of stroke. Families with good knowledge have an early hospital arrival because they understand the impact of late stroke treatment – permanent disability and even death.

On the other hand, the less knowledge the family has the more delayed hospital arrival. Previous research revealed factors that affect hospital arrival time were knowledge, educational level, perception, distance, economic status, and transportation (Saudin et al., 2016). Other studies also showed that beliefs and perceptions positively affected the period of family decision-making to bring stroke patients to the hospital (Zauhani Kusnul, 2019). Health information about prehospital stroke detection and the importance of immediate treatment in stroke patients is crucial. It increases knowledge for families and stroke patients. As a result, there is no delayed treatment when a stroke occurs.

LIMITATION

Filling out the questionnaire is not placed in a special room but in the treatment room and in the waiting room where the atmosphere is not conducive so that it disturbs the concentration of respondents and it is possible to affect the expected results, besides the number of respondents is small so that researchers do not classify the incidence of stroke.

CONCLUSION

In conclusion, the better family knowledge on prehospital stroke detection, the faster hospital time arrival. Health workers should give health education on prehospital stroke detection to prevent delayed hospital arrival. Further research could involve electronic and social media to improve knowledge on prehospital stroke detection.

AUTHOR CONTRIBUTION

Nur Ainiyah   : Conceptualization, methodology, writing-original draft, and supervision

Shobibatur Rohmah   : Software, validation, and formal analysis

Chilyatiz Zahroh   : Investigation, resources, and data duration

Difran Nobel Bistara   : Visualization, project administration and funding acquisition

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CONFLICT OF INTEREST

The authors have consented and no conflicting interests.

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