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Relationship Between Knowledge Level, Distance from Home and Type of Transportation with Length of Arrival of Stroke Patients in The Emergency Group of Prof. Dr. Margono Soekarjo Purwokerto Hospital

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ABSTRACT

Background: Stroke is a medical emergency condition (stroke is brain attack), the faster the diagnosis is made, the faster the treatment. The low level of public understanding of strokes results in families delaying taking stroke patients to health facilities. Method: This study uses a descriptive correlative study with a cross-sectional approach. The sample in this study was 41 respondents with stroke attacks who came to the Emergency Room of Prof. Dr. Margono Soekarjo Hospital with the research instrument used being a questionnaire. Results: Respondent characteristics were female 51.2%, college education level (PT) 46.5%, private job type 56.0%, and respondents aged 41 years to 50 years 51.4%. Respondents with good knowledge 48.8%, distance from home to RSMS ER <10 KM (close) 48.8%. The type of transportation used was a private car 70.7%, then the length of arrival of stroke patients to the RSMS ER according to the golden time is 58.5%. Family knowledge about stroke is good with the length of the arrival of stroke patients at the RSMS ER <4.5 hours 58.5%, distance from home 1-10 KM with the speed of the family carrying stroke patients <4.5 hours 36.6%, and the type of private car transportation with the speed of the family carrying stroke patients <4.5 hours 36.1%. Conclusion: There was a relationship between the level of family knowledge about stroke and the speed of the family taking the stroke patient to the hospital. There is no relationship between the distance from home and the length of time the stroke patient arrives at the RSMS Emergency Room. There is a relationship between the type of transportation and the length of time the stroke patient arrives at the RSMS Emergency Room.

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1. INTRODUCTION

Stroke is a medical emergency (Stroke Is Brain Attack), stroke treatment is a race against time, the faster the diagnosis is made, the faster the treatment, the better the outcome (Time is Brain). Stroke is an acute clinical manifestation due to neurological dysfunction in the brain, spinal cord, and retina, either partially or completely, which persists for ≥24 hours or causes death due to blood vessel disorders. Stroke is divided into

two, namely those caused by infarction called ischemic stroke. Hemorrhagic stroke can be caused by intracranial or subarachnoid hemorrhage.[1]

The second leading cause of death in the world is stroke.[2] Worldwide, stroke kills at least 1 person in 6 seconds with an estimated 15 million people in the world having a stroke each year. 5 million of them die and 5 million others experience permanent disability.[3] The incidence of stroke according to WHO is 13.7 million annually, the death rate is 5.5 million. The number of stroke sufferers from year to year continues to increase the prevalence (per thousand) of stroke in Indonesia in the population aged > 15 years by 10.9% or an estimated 2,412,297 people.[4] Central Java Province ranks 11th out of 35 provinces with a percentage of 11.8% or 96,794 people [4]. Medical records of patients at the Emergency Room of Prof. DR Margono Soekarjo Purwokerto Hospital show data on stroke patient visits of 531 patients in 2022 with an average number of 44.25 patients per month.

The low level of public understanding of strokes has resulted in families delaying the arrival of stroke patients to health facilities. According to [3] several factors that influence the delay in the golden hour of ischemic stroke patients, namely 3-4.5 hours, are the level of knowledge, distance from home to hospital, level of education, perception, type of transportation and economic status.[18] In Indonesia, there is a problem of delays in providing care to stroke patients, which can cause disability and death. Ultimately, stroke patients who are taken to the hospital will experience delayed treatment due to dangers that the community is not aware of.[5]

According to a study conducted in Riyadh, Saudi Arabia, from November 2012 to April 2013, the distance from home to the hospital was a significant factor in the delay in the arrival of stroke patients to the Emergency Department of the Hospital.[6]

In a study conducted in Nepal. G at all (2019) found that the level of education of families or stroke patients higher than high school p <0.001 affected the arrival of stroke patients at the hospital earlier. In addition, it was found that families and patients with higher levels of education tended to have shorter prehospital delays.[6]

In addition to distance traveled, the type of vehicle used also affects the process of immediate management of stroke patients to the hospital. In a literature review conducted, it was found that the use of ambulances can reduce the travel time of patients experiencing stroke attacks, which can reduce the number of prehospital delays.[7]

Income level will affect the ability of families and patients to finance medical care. A significant predictor of delayed hospital presentation was found to be lack of money available to pay for hospital costs at the time of stroke (OR, 6.64; 95% CI, 2.05-21.53; p = 0.002). [8] Prasetyo (2018) showed that, in a study he conducted in five government hospitals in Jakarta, financing factors were one of the considerations when choosing a hospital. This occurred even though there was no statistical significance between delays in hospitalization and financing (p = 0.60).[15]

Of the various factors that influence the length of time it takes for stroke patients to arrive at health facilities, the author is interested in studying more deeply the level of knowledge, distance from home and type of transportation used by stroke patients to get to health facilities. Because knowledge can change people's behavior in deciding to take their families to health facilities when a family member has a stroke. Especially for people in Banyumas Regency and its surroundings.

2. RESEARCH METHOD

This study is a correlative descriptive research aimed to determine whether there is a relationship between the independent variable and the dependent variable. This study aims to identify the relationship between the length of arrival of stroke patients to the Emergency Room of Prof. DR. Margono Soekarjo Purwokerto Hospital with the level of knowledge, distance from home, and type of transportation.The study was conducted at the Emergency Room of Prof. Dr. Margono Soekarjo Purwokerto Hospital in February-April 2024. This study involved all stroke patients who came to the Emergency Room (IGD) of Prof. Dr. Margono Soekarjo Purwokerto Hospital from January to December 2022, including infarct stroke, ischemic stroke, and hemorrhagic stroke. The data processing process in this study used the processing and research process according to Notoatmodjo, namely editing, coding, scoring, data entry, data tabulation, cleaning.[10]

3. RESULT AND DISCUSSION

a. Characteristics of Gender, Education, Occupation and Age

Table 1. Description Table of Gender, Education, Occupation and Age of Respondents at RSUD Prof. Dr. Margono Soekarjo Purwokerto

Characteristics	Frequency (f)	Presentase (%)
Jenis Kelamin		
Male	20	48,8

Characteristics	Frequency (f)	Presentase (%)
Female	21	51,2
Education		
Elementary school	5	12,2
Junior high school	7	17,1
Senior high school	10	24,4
College	19	46,3
Jobs		
Government employees	9	22,0
Housewife	10	24,0
Private	22	56,0
Age		
< 30 th	3	7,3
31-40 th	4	9,8
41-50 th	21	51,2
51-60 th	10	24,4
> 61 th	3	7,3
Total	41	100,0

Table above shows that the majority of female respondents are 21 (51.2%) respondents, with the educational level of the majority of tertiary institutions (PT) 19 (46.5%) of respondents, then the majority are private sector workers. There are 22 (56.0%) respondents and the majority aged 41 to 50 years are 21 (51.4%) respondents.

b. The Level of Knowledge of The Family, The Distance at Home of The Stroke Sufferer and The Speed at Which The Family Carries The Stroke Sufferer

Table 2. Table Description of The Level of Knowledge of The Family, Distance to Home of The Stroke Sufferer, Type of Transportation and Time of Arrival of The Stroke Patient in The IGD RSUD Prof DR Margono Soekarjo Purwokerto

Variabel	Frequency (f)	Percentage (%)
Family knowledge level		
Less	13	31,7
Enough	8	19,5
Good	20	48,8
Total	41	100,0
Distance from home		
Near (<10 km)	20	48,8
Middle (11-20 km)	7	17,1
Far (> 21 km)	14	34,1
Total	41	100,0
Trasportation Type		
Ambulance	12	29,3
Private Car	29	70,7
Total	41	100,0
Time of arrival		
According to golden time	24	58,5
Beyond the golden time	17	41,5
Total	41	100,0

Table above shows that the majority of respondents who have good knowledge are 20 (48.8%) respondents, distance between home and IGD RSMS < 10 iKM i(near) as many as 20 (48.8%) respondents, then type transportation which is used for. The majority of stroke patients who were taken to the RSMS emergency room used private vehicles, 29 (70.7%) respondents. The time most frequently used to bring istroke patients to the ER RSMS is golden time, 24 (58.5%) respondents.

c. Analysis of The Relationship Between The Level of Family Knowledge About Stroke and The Length of Time A Stroke Patient Arrives at The RSMS IGD

Table 3. Relationship Between Level of Knowledge and Age

Level of family knowledge about stroke	Stroke patient arrival time		Total	P *Value*
	< 4,5 hour Frequency (%)	> 4,5 hour Frequency (%)		
Less	1 (2,45)	12 (29,4)	13 (31,7)	0,01
Enough	4 (9,75)	4 (9,7)	8 (19,5)	
Good	19 (46,3)	1 (2,4)	20 (48,8)	
Total	24 (58,5)	17 (41,5)	41 (100)	

Table above shows the family's knowledge about stroke and the time of arrival of the stroke patient in the ER, RSMS <4.5 hours is as much as 24 (58.5%), there is a relationship between the level of family knowledge about stroke and the speed at which the family carries the stroke sufferer. hospital with the value of p 0.01 (<0.05).

c. Analysis of The Relationship Between The Distance from Home and The Length of Time of Arrival of Stroke Patients at The RSMS IGD

Table 4. Relationship Between The Distance of The Stroke Patient's Home And The Length of Time The Stroke Patient Arrived at The IGD IRSMS

	Length of arrival of stroke patients		Total	P *Value*
Distance from Home	<4,5 hour Frequency (%)	>4,5 hour Frequency (%)		
1-10 KM	15 (36,6)	5 (12,3)	20 (48,8)	0,73
11-20 KM	4 (9,7)	3 (7,3)	7 (17,1)	
≥ 20 KM	5 (12,2)	9 (21,9)	14 (34,1)	
Total	24 (58,5)	17 (41,5)	41 (100)	

Table above shows the rate at home 1-10 KM with the speed at which families bring stroke sufferers <4.5 hours is 15 (36.6%), there is no relationship between the rate at home and the duration of arrival of istroke patients at IGD RSMS. P value 0.73 (p>0.05).

e. Analysis of The Relationship Between The Type of Transportation Used and The Arrival Time of Stroke Patients In The RSMS IGD

Table 5. Table The Relationship Between The Type of Transportation and The Time of Arrival of Stroke Patients in The RSMS IGD

	Length of arrival of stroke patients at the IGD RSMS		**Total**	***P Value***
Transportation Type	<4,5 hour Frequency (%)	>4,5 hour Frequency (%)		
Ambulance	1 (2,4)	11 (26,9)	12 (29,3)	0,01
Private Car	23 (56,1)	6 (14,6)	29 (70,7)	

	Length of arrival of stroke patients at the IGD RSMS		Total	*P Value*
Total	24 (58,5)	17 (41,5)	41 (100)	

Table above shows the types of private mobile transportation with the speed of family carrying stroke sufferers <4.5 hours 23 536.1%, there is a relationship between the types of transportation and the arrival time of stroke patients in RSMS IGD 0,01 (<0.05).

DISCUSSION

a. Level of Knowledge About Stroke

The results of the research show that the majority of respondents who have good knowledge are 20 (48.8%). This has a correlation with the educational level of the majority of respondents who graduated from tertiary institutions. Research conducted by [11] in a hospital in the city of Semarang found that there is an influence between the level of knowledge and the response of family members to a family who has experienced a stroke so that this also influences the length of arrival of a stroke patient in a health facility. In another study by [12] it was shown that respondents who had good knowledge about stroke would have better abilities in carrying out early detection of signs of stroke. The signs and clinical symptoms that lead to istroke are : asymmetrical smile (slanting like one side), choking and difficulty drinking water. The movement of half of the body weakens suddenly. Speak sloppily or can't speak suddenly, can't understand words or doesn't speak coherently. Numbness, tingling or numbness in half of body. Nearsightedness, blurred vision that occurs suddenly, severe headaches that appear suddenly, disturbances in balance function such as spinning or even loss of consciousness or fainting. Later, the Ministry of Health RI shortened it to SeGeRa Ke RS. Then in the AHA/ASA Guidline, use the term FAST (Facial imovement, Arm imovement, Speech, Time is Critical) to make it easier to quickly identify strokes.[2]

b. Distance Between The Stroke Sufferer's House and The Stroke Sufferer's Family

The results of the study showed that the majority of the distance from home to the hospital was 1-10 KM as many as 20 (48.8%), the distance from home is one of the levels of success in treating stroke patients, the distance from home to the hospital is how far the patient travels from home to the place of treatment or health services. [14] Empirically, the distance from the place of residence will affect the length of time it takes for stroke patients to arrive at the hospital.[5] The distance for treatment is how far the patient travels from home to the place of treatment or to the hospital. The results of this study indicate that many patients who are taken to the RSMS Emergency Room come from outside the area. Research that has been conducted by several respondents or families states that how far the distance traveled for stroke patients to recover will be done, meaning that distance is not an obstacle for those who seek treatment, because it is the family's obligation to care for stroke patients. In this study, no significant effect was found between the distance from home and the length of time stroke patients arrived at the RSMS Emergency Room.

c. Type of Transportation

The results of this study were also found by Barahama et al. where 184 patients (79.65%) used an ambulance, while 47 patients (20.35%) did not use it; most patients (29 patients, 70.7%) came to the hospital by private car or without using an ambulance.[15]

This is because the level of knowledge of family members of stroke patients is much more important than the availability of an ambulance as a means of transportation, while in some areas there are indeed no affordable ambulance facilities, both in terms of distance, time and cost. The results of Prasetyo's also showed the same thing: most patients did not use an ambulance when they arrived at the hospital. In the study, 105 patients (95.5%) did not use an ambulance, and only 5 patients (4.5%) used an ambulance.[15]

A study conducted in DKI Jakarta stated that not every sub-district area has an ambulance, so most people prefer to use vehicles other than ambulances as a means of transportation to take their family members to health facilities because of reasons of affordability in terms of distance, time and cost. Some ambulances managed by mass organizations or villages also have standard operating procedures (SOPs) that must be carried out when using them, starting from filling out the ambulance usage form, providing requirements such as a photocopy of identity, then also having to ensure the presence of a driver and even requiring a travel letter, and of course some of these things hinder the ability to take patients immediately to a health facility.

d. Length of Arrival of Stroke Patients at the RSMS Emergency Room

The results of the study showed that the majority of respondents indicated the speed of the family taking a family member who had a stroke to the hospital, which was less than 4.5 hours, as many as 24 (58.5%), and the speed of the family taking them to get the care and treatment needed to prevent death. The philosophy of stroke management is that time is brain and the golden hour is 4.5 hours, because early stroke management reduces death and brain damage.[1] Hospitals that have CT scan or MRI imaging facilities must provide multidisciplinary services to patients who have strokes as quickly as possible. For six hours, these patients are

considered hyperacute. The goal of this hyperacute phase management is to reduce the number of deaths and disabilities. Multidisciplinary management of the hyperacute phase begins when the patient has an attack and ends when the patient receives reperfusion therapy in the hospital, so this management can be sequenced from pre-hospital and hospital management.[11]

e. Analysis of The Relationship Between The Level of Family Knowledge about Stroke and The Length of Time Stroke Patients Arrive at The RSMS Emergency Room.

The results of the study showed that there was a relationship between the level of family knowledge about stroke and the length of time a stroke patient arrived at the RSMS Emergency Room with a Chi Square test calculation with a p value of 0.01 ($p < 0.05$). This supports the findings of the study that family knowledge is related to the ability to detect acute ischemic stroke attacks in prehospital care.[7] If they can detect signs and symptoms of stroke quickly, members will be more concerned about immediately taking their family members who have had a stroke to the hospital. This clearly has a big impact because ischemic stroke patients reach the golden hour, or 4.5 hours.

Within four and a half hours after acute ischemic stroke, tissue plasminogen activator works well. However, because patients did not arrive at the hospital in Riyadh, Saudi Arabia, most of them still did not receive treatment.

The results of the study showed that some of the causes of late patient arrivals were as follows: patients were alone during a stroke, patients were not taken to the hospital by ambulance, patients were not aware that they had the disease, the long distance between the hospital and their residence, lack of patient knowledge, difficulties faced by patients in accessing health services, and others. Widi (2013) in (Muhamad Arif et al., 2018) said that fast and appropriate treatment is the key to reducing death and brain damage due to ischemic stroke. Fassbender stated that the most recommended time to treat stroke patients is three to four hours, or the golden period. If stroke treatment is given more than the golden period, the neurological damage experienced by the patient will last a long time.[20]

f. Analysis of The Relationship Between Distance from Home and The Length of Stay of Stroke Patients at The RSMS Emergency Room

Based on the Chi Square calculation with a p value (p 0.073), bivariate analysis showed that there was no statistically significant relationship between the distance of the patient's residence and the length of arrival of stroke patients at the RSMS Emergency Room. According to research by Arulprakash & Umaiorubahan (2019), the time of arrival at the hospital was not significantly influenced by distance ($p = 0.449$).[16] However, the findings of Prasetyo's (2018) study conducted in Jakarta, which found a significant relationship between the distance of residence and the hospital ($p = 0.010$), did not match the findings of this study.[9]

This study did not find a significant relationship between the distance of residence and the delay in the arrival of stroke patients to the hospital (Table 4.4). This conclusion differs from another study conducted in Riyadh, Saudi Arabia, which found that one of the important factors associated with the delay in the arrival of stroke patients to the hospital was the location of the residence.[12]

Stroke patients who live outside the city of Riyadh tend to arrive late at the hospital. However, there are several other factors that influence the delay in arrival of stroke patients to the hospital, such as geographical conditions and whether stroke patients go directly to the hospital or visit a local primary health care facility first. According to this study, there was no significant correlation between the distance of stroke patients' residence and their delay in arrival to the hospital. Patients' knowledge of stroke symptoms and signs was the main factor influencing the time of arrival of stroke patients to the hospital, although previous studies in India found that closer distance from the patient's residence to the hospital was a factor that played a role in the speed of patient arrival to the hospital.[6]

g. Analysis of The Relationship Between The Type of Transportation Used and The Length of Time Stroke Patients Arrive at The RSMS Emergency Room

The results of the study showed that non-ambulance cars were the most common mode of transportation to transport stroke patients to the RSMS Emergency Room, as many as 29 (70.7%). A mixed-method study conducted by Alalawi (2018) found that the response to stroke emergencies was ideal, namely going immediately to the hospital. Most people (90.3%) said that the first thing they would do when they had a stroke was to go to the hospital immediately. However, only 7.6% of people who answered took the initiative to call an ambulance first. Almost all studies found that stroke patients who were transferred to the hospital did not use ambulance services from EMS. This happened in China 84.6% (Yin et al., 2016), Saudi Arabia 81.5% [9], and Indonesia 95.5% [9]. According to the 2018 American Stroke Association (ASA) guidelines, the most common method of transportation used to transport stroke patients was non-ambulance cars (46.67%). Ambulances are the best way to transport patients with stroke.[11] Meanwhile, there is a correlation between direct arrival to the Emergency Department (ED) and a lower likelihood of prehospital delay.[19] In addition, there is evidence that the use of private vehicles is correlated with lower prehospital delay. A study in Egypt showed how the readiness of the emergency assistance system and referral system in the study area influenced

the evaluation of the use of private vehicles more quickly. This is a note for the related hospitals that expediting hospital services can reduce the likelihood of delay.

In a study conducted by Prasetyo on the use of ambulances by stroke patients in Indonesia, he found that, in addition to the lack of socialization and limited facilities and infrastructure, the use of ambulances is still low in Indonesia. However, the study found that the use of ambulances can affect how long patients stay in the hospital.[9] Regulation of the Minister of Health of the Republic of Indonesia Number 47 of 2018 concerning emergency services and Regulation of the Minister of Health Number 19 of 2016 concerning the Integrated Emergency Management System (SPGDT).[1] It is explained that there is a national command center that applies throughout Indonesia with the access code 119. The Public Safety Center (PSC) is the main part of the SPGDT and is responsible for organizing and providing emergency services in cities and/or districts. The PSC can also assist with emergency services, triage, first aid, and the victim evacuation process. They can also assist in coordination between health facilities, including referral systems if needed. The regulation also states that pre-facility health care management, also known as prehospital care, is part of the emergency patient care system.[19]

Health workers from PSC are also responsible for providing first aid at the scene or during the medical evacuation process before arriving at the health care facility and. PSC is responsible for coordination between hospitals and call centers to ensure the availability of ambulances, services provided, and treatment rooms. In this medical evacuation process, transport ambulances or emergency ambulances can be used according to patient indications by paying attention to patient resuscitation and stabilization efforts. The existence of PSC can help reduce the possibility of prehospital delays in stroke patients.

However, as reported by the Media Indonesia news site in May 2018, only around 160 districts and cities have PSC programs, even though there are at least 514 districts and cities in Indonesia. These figures show that this PSC program is not yet widespread. This PSC solution can be implemented in Indonesia to reduce prehospital delays in stroke patients. This will not only reduce travel time to the hospital, but can also provide first aid to patients experiencing stroke onset. Especially for stroke patients, medical personnel sent by the PSC must have the ability to quickly determine the next steps that need to be taken, including referring patients to health facilities that can provide adequate care for them.[17]

4. CONCLUSION

From the results of the study on "The Relationship between Level of Knowledge, Distance from Home and Type of Transportation with the Length of Arrival of Stroke Patients at the Emergency Room of Prof. DR Margono Soekarjo Hospital" the following conclusions can be drawn:

a. Of the 41 respondents who were the subjects of the study, there were 21 (51.2%) female respondents, 20 (48.8%) male. Then the majority of respondents were in the age range of 41-50 years, namely 21 (51.2%), the majority of respondents totaling 22 (53.7%) had jobs as private workers, then most of the respondents had received education up to tertiary level, namely 19 (46.3%) respondents.
b. There were 41 respondents in the study, then divided into 3 classifications, namely good, moderate and poor knowledge. There were 20 (48.8%) respondents with good knowledge, there were 8 (19.5%) respondents with sufficient knowledge, and 13 (31.7%) respondents with poor knowledge.
c. The distance of the respondents' homes is classified into 3, namely: close (<10 km) with 20 (28.8%) respondents, medium distance (11-20 km) with 7 (17.1%) and long distance with 14 (34.1%).
d. There are two types of transportation used to transport stroke patients to the RSMS Emergency Room, namely ambulances and non-ambulances (private cars). Of all respondents, 12 (29.3%) respondents used ambulances, the remaining 29 (70.7%) respondents used private cars.
e. There is a relationship between the level of knowledge and the length of arrival of stroke patients at the Emergency Room of Prof. DR Margono Soekarjo Hospital.
f. There is no relationship between the distance of the home and the length of arrival of stroke patients at the Emergency Room of Prof. DR Margono Soekarjo Hospital.
g. There is a relationship between the type of transportation used and the length of arrival of stroke patients at the Emergency Room of Prof. DR Margono Soekarjo Hospital.

REFERENCES

Republic of Indonesia, Decree of the Minister of Health No. HK.01.07 /MENKES/394/2019 on National Guidelines for Medical Services for Stroke Management.

American Heart Association. (2018). Get With The Guidelines ® – Stroke is the American Heart Association's collaborative performance improvement program, demonstrated to improve adherence to evidence-based care of patients hospitalized with stroke, 1–6.

Okraini. (2018a). The Relationship of GoldenPeriod Accuracy with the Degree of Neurological Damage in Ischemic Stroke Patients in the Emergency Room of the Bukittinggi National Stroke Hospital.

Basic Health Research. (2018)

Astina, 2020. Relationship Between Referral Time and Neurological Deficit Level in Stroke Patients at Sultan Immanudin Hospital, Pangkalan Bun.

Barahama, D. V., Tangkudung, G., & Kembuan, M. A. H. N. (2019). Factors Associated with Late Arrival of Stroke Patients at Prof. Dr. R. D. Kandou Manado General Hospital. E-Clinic Journal (ECl), 7(1), 1–6.

Kim, D.-H., Nah, H.-W., Park, H.-S., Choi, J.-H., Kang, M.-J., Huh, J.-T., & Cha , J.-K. (2016). Impact of Prehospital Intervention on Delay Time to Thrombolytic Therapy in a Stroke Center with a Systemized Stroke Code Program. Journal of Stroke and Cerebrovascular Diseases, 25(7), 1665–1670. https://doi.org/ 10.1016/j.jstrokecerebrovasdis.2016.02.011 Mansfield, A., Inness, E. L., & Mcilroy, W. E. (2018). Strokes. In Handbook of Clinical Neurology (Vol. 159, pp. 205–228). https://doi.org/10.1016/B978-0-444-63916-5.00013-6 National Institute of Neurological Disorders and Stroke (NIDDS). (2009). Stroke: challenges, progress, and promise. Retrieved May 2, 2019, from https://stroke.nih.gov/documents/NINDS_StrokeChallenge_ Brochure.pdf.

Seremwe, F., Kaseke, F., Chikwanha, T. M., & Chikwasha, V. (2017). Factors associated with hospital arrival time after the onset of stroke symptoms: A cross-sectional study at two teaching hospitals in Harare, Zimbabwe. Malawi Medical Journal, 29(2), 171–176. https://doi.org/10.4314/mmj.v29i2.18 Smeltzer, S. C., Hinkle, J. L., Bare, B. G., & Cheever, K. H. (2010). Brunner & Suddarth's Textbook of Medical-Surgical Nursing (12th ed.). Wolters Kluwer Health / Lippincott Williams & Wilkins.

Prasetyo, E. (2018). Factors Affecting the Delay of Stroke Patients Acute Coming to Five Government Hospitals in DKI Jakarta. Pharmamedika Health Journal, 9(1), 040. https://doi.org/10.33476/mkp.v9i1.674

Notoatmodjo, S. (2012). CHAPTER III RESEARCH METHOD A. Type and design of research This research is a type of quantitative research with a quasi experimental design, namely an experimental activity where researchers will control some of the variables that influence. PT. Rineka Cipta.

Advani, R., Naess, H., & Kurz, M. W. (2017). The golden hour of acute ischemic stroke. Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine, 25(1), 1–5. https://doi.org/10.1186/s13049-017-0398-5

Al Khathaami, A. M., Mohammad, Y. O., Alibrahim, F. S., & Jradi, H. A. (2018). Factors associated with late arrival of acute stroke patients to emergency department in Saudi Arabia. SAGE Open Medicine, 6, 205031211877671. https://doi.org/10.1177/2050312118776719 Alalawi, S. (2018). "Knowledge, perception, action and intention to modify healthy lifestyle behavior in Omani patients at risk of stroke." University of Edinburgh.

Rosmary, M, T, N, Handayani, F. (2020). The Relationship between Family Knowledge and Family Behavior in Early Handling of Stroke Incidents. Journal of Holistic Nursing and Health Science. 3(1). 32-39.

Rachmawati, D., Andarini, S., & Ningsih, D. K. (2017). Family Knowledge Plays a Role in Late Arrival Acute Ischemic Stroke Patients in Emergency Room. Brawijaya Medical Journal, 29(4), 369–376. https://doi.org/10.21776/ub.jkb.2017.029.04.15

Hakiki, S, N, Kosasih, C, E, Styawati, A. (2021) Literature Study: Scoping Review of Factors in Prehospital Delay in Stroke Patients. Indonesian Nursing Journal. 5(2). 656-671.

Arulprakash, N., & Umaiorubahan, M. (2019). Causes of delayed arrival with acute ischemic stroke beyond the window period of thrombolysis. Journal of Family Medicine and Primary Care, 7(6), 1248–1252. https://doi.org/ 10.4103/jfmpc.jfmpc_13_17

Crouch, R., Charters, A., Dawood , M., & Bennet, P. (Eds.). (2017). Oxford Handbook of Emergency Nursing (2nd ed.). Oxford University Press.

Okraini , N. (2018b). The Relationship between the Accuracy of the “Golden Period” and the Degree of Neurological Damage in National Stroke Patients in Bukittinggi in 2018. 2(1), 94–98.

Sari, L, M, Yuliano, a, Almudriki. (2019). The Relationship between Knowledge and Attitudes to the Ability to Detect Early Acute Ischemic Stroke Attacks in Pre-Hospital Handling. Pioneer Health Journal. 6(1).

Wang, D., & Wang, Y. (2019). Tissue window, not the time window, will guide acute stroke treatment. Stroke and Vascular Neurology, 4(1), 1–2. https://doi.org/ 10.1136/svn-2018-000211