

Original Research**The Relationship Between The Response Time of The Family When Bringing The Patient to Hospital and Stroke Severity Patients****Lindawati Farida Tampubolon¹, Agustaria Ginting², Natalia Natalia^{3*}**^{1,2,3} Department of Nursing, STIKes Santa Elisabeth Medan, Indonesia**ABSTRACT**

Background: *Non-infectious diseases, especially strokes, are increasing in Indonesia. The problem that occurs at this time is that there are still many families who do not know or don't know at all about the early detection of stroke attacks. The study aims to determine the relationship between family response time in bringing stroke patients to the hospital and the severity of stroke patients at H. Adam Malik General Hospital Medan.*

Methods: *This research is an analytic observational study with a cross-sectional design. The research population is unknown with a total sample of 35 people, where the sample is taken based on a purposive sampling technique, and data collection uses the NHISS instrument.*

Results: *The results of the study find that the median response time value was 4.00 and the SD value is 42.33, while the median stroke patient severity is 21.00 and the SD value is 14.248. Based on Spearman's rho test results, the p-value is $0.008 < \alpha = 0.05$, meaning that there is a correlation between family response time and the severity of stroke patients. The correlation coefficient value is 0.441, which means that the faster the family's response time in bringing the patient to the hospital, the lighter the stroke patient's severity.*

Conclusion: *It is hoped that the family will be able to carry out an initial stroke assessment at home by looking at a smile that tilts to one side, half of the body is weak and speaks pelo, and immediately takes the patient to the hospital.*

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relationship, response, stroke;

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INTRODUCTION

Stroke is a condition in which there are changes in neurological function with clinical signs that can result in death within 24 hours or more with vascular causes. Stroke can occur when the brain does not get a blood supply that carries oxygen due to blockage or rupture of brain blood vessels, resulting in cell or tissue death (Sholihah & Kanita, 2022). There are currently many phenomena or problems that occur in families who do not know or do not know at all about early detection of stroke.

In general, families only become aware and seek help if there are severe clinical symptoms and functional impairment, whereas mild symptoms do not get a response from patients, even though mild symptoms can result in disability and even death in patients if not treated quickly (Prasetyo, 2018). Stroke accounts for 11.8% of total deaths in Indonesia and is the leading cause of death and disability in sufferers (Sholihah & Kanita, 2022). The success of stroke treatment is influenced by speed, accuracy, and accuracy in the initial treatment of stroke patients. The speed of the family in carrying the patient plays an important role in the treatment of the patient. The right time to handle a stroke is ± 3 hours from the beginning of the attack, which is called the golden period (Ishariani & Rachmania, 2021).

According to the World Stroke Organisation (2022), globally, more than 12.2 million, or one in four people over the age of 25, will have a stroke, or more than 101 million people living today—more than 7.6 million, or 62%, of new ischemic strokes each year (Dwilaksono et al., 2023). H. Adam Malik Central General Hospital Medan is part of the health service system in Medan, in addition to carrying out curative and rehabilitative health services, it also plays a role in carrying out promotional and preventive activities in the health sector. In January–December 2022, H. Adam Malik Medan Hospital received 235 patients with ischemic stroke and hemorrhagic stroke, as many as 235 patients with outpatient care, and 1003 stroke patients with hospitalization.

Response time is very important in handling stroke patients. The duration of time when the patient has a stroke attack or stroke symptoms until the patient's arrival at the hospital is called prehospital delay. Every 15 minutes of prehospital delay reduces the risk of death by 5% (Sadikin Bandung et al., 2020).

The main concepts in stroke management are "time is the brain" and "golden period". Basically, stroke patients should get treatment within three hours after the first symptoms are recognized. This is an important key to reducing deaths and minimising brain damage caused by stroke. If stroke treatment is given more than the golden period, the neurological damage experienced by the patient will be permanent.

One of the efforts to achieve the goal of stroke management is by early recognition of the signs of stroke symptoms and fast and appropriate pre-hospital treatment (Santosa & Trisnain, 2019). The problem that often occurs is that there are still many families that have not been able to detect early stroke. The success of handling pre-hospital conditions in families of patients with stroke is strongly influenced by the level of family knowledge in detecting stroke; families are able to identify risk factors for stroke, location of events far from health services, companion assistance as a support system, previous stroke history, stroke comorbidities associated with the severity of stroke, and economic factors in financing treatment (Setianingsih et al., 2019).

Based on the above background, the author is interested in conducting research at RSUP H. Adam Malik Medan because there has never been a study on the relationship between family response time and the severity of stroke patients, and also because researchers are interested in knowing the correlation of response time with the level of dairy stroke patients.

MATERIALS AND METHOD

The type of research used in this study is observational analytic by using a cross-sectional design, which is a study of the dynamics and correlation between risk factors and effects with an approach, observation, or data collection at one time (point-time

approach), meaning that each research subject is only observed once and measurements are made of the status of the subject variable at the time of the examination. This design was used to determine the relationship between family response time in bringing patients to the hospital and the severity of stroke patients at the Hospital. H. Adam Malik Medan in 2023.

The population in this study were stroke patients who underwent hospitalization at the Hospital H. Adam Malik Medan. The description of the number of patients per year is 1003 people, with an estimated population of 83 people/month (Medical Records, H. Adam Malik Hospital Medan 2022). Sampling in this study used the purposive sampling technique, which is a sample determination technique by selecting the population according to the criteria set by the researcher. The inclusion criteria in this study are as follows: Stroke patients who underwent hospitalization at H. Adam Malik Medan Hospital ≤ 3 days, having a family member on standby to accompany the patient during hospitalization. However, due to time constraints, the sample that was finally obtained during the research period was 35 people.

In this study, there are two types of variables. The independent variable in this study is family response time. The dependent variable in the study is the severity of stroke patients. The instrument used in this study was the National Institute of Health Stroke Scale (NIHSS) observation format sourced from the book (Kwah & Diong, 2014). In this format, demographic data of the patient and the length of time the patient was brought to the hospital (response time) were added.

Demographic data consisted of age, gender, distance from home to hospital, number of strokes, and patient history. The National Institute of Health Stroke Scale (NIHSS) format consists of 11 observational components to measure the severity of stroke patients. This research was conducted at H. Adam Malik Medan Central General Hospital. Researchers chose RSUP H. Adam Malik Medan because this hospital has a special room for neurology problems and also a stroke corner. This research will be conducted in March-April 2023.

Data were obtained directly from the research subjects using the National Institute of Health Stroke Scale (NIHSS) observation format, which is a measuring tool to assess the severity of stroke patients that is fast, easy, and sensitive. NIHSS is the gold standard for assessing the severity of stroke patients. Demographic data as well as response time were obtained from medical records and interviews with families accompanying patients at H. Adam Malik Hospital Medan.

The data collection method used was by providing demographic data sheets and conducting anamesa time of arrival, and researchers assessed the level of severity with the NIHSS score to respondents. In this thesis research, the author did not conduct a reliability validation test because the NIHSS questionnaire was standardized and taken from the book (Kwah & Diong, 2014). Data analysis of the research results will be carried out through 2 stages, namely: univariate analysis and bivariate analysis. Univariate analysis aims to analyze the quality of one variable at a time.

In this study, univariate statistical methods were used to identify demographic data, independent variable response time, and independent variable severity of stroke patients. Bivariate analysis is to be used for two variables that are suspected to be related or correlated. Researchers did not use the product-moment correlation test (at $\alpha 0.05$) because, from the results of the Shapiro-Wilk normality test, the response time results were obtained with Sig. 0.000 and the result of severity in stroke patients is 0.003. It can be concluded that the Sig data <0.005 , the data is not abnormally

distributed, thus making researchers use Spearman's Rho correlation test for abnormal data distribution.

This research has also been ethically qualified by the Health Research Commission of STIKes Santa Elisabeth Medan with letter number No. 044/KEPK-SE/PE-DT/III/2023.

RESULTS

The results of this study were to determine the relationship between family response time in bringing patients to the hospital and the severity of stroke patients at H. Adam Malik Medan Hospital. In this study, using two analyses, namely univariate analysis to identify demographic data, independent variable response time, and independent variable severity of stroke patients, while bivariate analysis to identify the relationship of family response time with the severity of stroke patients using the Spearman rank correlation test with a sample obtained as many as 35 respondents.

Characteristics of Research Respondents

Table 1. Distribution of respondents based on gender, stroke onset, disease history, and family response at Haji Adam Malik Hospital Medan in 2023 (n=35)

| Respondent Characteristics | F | % |
|--|----------|----------|
| Gender | | |
| Male | 18 | 51,4 |
| Female | 17 | 48,6 |
| Stroke Attack | | |
| One Time | 21 | 60 |
| Twice | 9 | 25,7 |
| Three Times | 5 | 14,3 |
| Disease History | | |
| None | 3 | 8,6 |
| (Hypertension, Hypercholesterolemia, Hyperthyroidism, DM, Gastric disorders, heart disease, renal failure infection) | 32 | 91,4 |
| Family Response | | |
| Immediately Go to Emergency Room/Hospital | 29 | 82,9 |
| Bring to the doctor's office | 2 | 5,7 |
| Contacting immediate family/next-door neighbors | 13 | 2,9 |

Based on Table 1, out of 35 stroke patients at H. Adam Malik Hospital Medan, the majority of respondents were male, as many as 18 people (51.4%). In the history of stroke attacks, the majority of respondents had a history of stroke attacks 1 time, as many as 21 people (60%). In the history of the disease, the majority of respondents had a history of disease such as hypertension, hypercholesterolemia, hyperthyroidism, DM, heart disease, kidney failure infection, and gastric disorders, namely 32 people (91.4%). Regarding the family response, the majority of patients who experienced a stroke attack were immediately taken to the emergency room or hospital by the family, as many as 29 people (82.9%).

Characteristics based on age of respondents

Table 2. Distribution of respondents according to age at H. Adam Malik Hospital Medan in 2023 (n = 35)

| Variables | N | Median | SD | Minimum-Maximum | 95% CI |
|-----------|----|--------|--------|-----------------|---------------|
| Age | 35 | 58 | 10,202 | 38 -75 | 54,95 - 61,96 |

Based on Table 2, out of 35 respondents, the youngest stroke patient was 38 years old and the oldest age was 75 years old, with SD 10, 202. The results of the 95% confidence interval estimation believed that the age range of stroke patients at Haji Adam Malik Hospital Medan was 54.95-61.96 years.

Family Response Time

Table 3. Response time of families in bringing stroke patients to the hospital at H. Adam Malik Hospital Medan in 2023

| Variables | N | Mean | Median | SD | Min-Max | 95% CI |
|----------------------|----|-------|--------|--------|---------|--------------|
| Family Response Time | 35 | 21,11 | 4,00 | 42,333 | 0-168 | 6,57 - 35,66 |

Tabel 3 shows that the mean family response time in bringing stroke patients to the hospital was 21.11 hours with a median of 4.00 and SD 42.333. The fastest time was 0 hours, and the longest time was 168 hours. The 95% confidence interval estimation results believed that the range of family response time in bringing stroke patients to the hospital was 6.57 - 35.66 hours.

Severity Level

Table 4. Severity of stroke patients at H. Adam Malik Hospital Medan in 2023 (n = 35)

| Variables | N | Mean | Median | SD | Min - Max | 95% CI |
|-------------------------|----|-------|--------|--------|-----------|-------------|
| Stroke Patient Severity | 35 | 20,34 | 21,00 | 14,248 | 1-41 | 15,45-25,24 |

Table 4 shows that the median severity of stroke patients at H. Adam Malik Medan Hospital in 2023 was at a score of 20 with SD 14.248. The lowest severity score is 1 and the highest severity is 41. From the results of the 95% confidence interval analysis, it is believed that the severity score of stroke patients is in the range of 15,45-25,24.

The relationship between family response time and the severity of stroke patients at H. Adam Malik Hospital Medan in 2023

Table 5. Correlation between family response time in bringing stroke patients to the hospital with the severity of stroke patients at H. Adam Malik Hospital Medan in 2023 (n=35)

| Spearmen's rho | Family Response | Correlation Corfficient | Family Response Time | Stroke Patient Severity |
|----------------|-----------------|-------------------------|----------------------|-------------------------|
| | | | 1.000 | .441 |

| | | Family Response Time | Stroke Patient Severity |
|-------------------------|-----------------|-----------------------------|--------------------------------|
| Time | Sig. (2-tailed) | | .008 |
| | N | 35 | 35 |
| Stroke patient severity | Correlation | 0.441 | 1.000 |
| | Corfficient | | |
| | Sig. (2-tailed) | 0.008 | . |
| | N | 35 | 35 |

In table 5, it can be explained that the statistical test results show that the p-value = 0.008 ($p < 0.05$) with a correlation value of 0.441, meaning that there is a relationship between family response time in bringing patients to the hospital and the severity of stroke patients, where the strength of this relationship is categorised as moderate.

DISCUSSION

Family *Response Time*

Based on the data above, the researcher assumes that the family's response time in bringing stroke patients to the hospital is still relatively long, as seen in the median response time of 4 hours with an estimated average overall time of 6.57-35.66 hours. This time is still far from the recommended time in stroke patients, which is less than three hours (golden period); as a result, it can worsen the condition of stroke patients. Fast and proper handling during the golden period can prevent the fatal impact of a stroke attack. The longer people ignore a stroke attack, the greater the brain damage that can occur.

Fast and appropriate treatment for patients who have a stroke attack can reduce 30% of disability and severity in stroke patients. Huttami & Hidajah (2020), state that brain damage causes nearly 2 million nerve cells to die, which can result in disability and even death. Reduction of disability due to stroke can occur if patients get treatment during the golden period. Early treatment can stabilise the patient's condition and prevent morbidity and mortality due to stroke (Huttami & Hidajah, 2020).

The results of this study are also in line with (Ishariani et al., 2019), which states that as many as 37 respondents, there are 17 patients experiencing golden period inaccuracy or passing the recommended time of 3 hours in the Emergency Room of the Bukittinggi National Stroke Hospital in 2018. However, the results of this study differ from the results of research (Ishariani & Rachmania, 2021). In Amalia Pare Hospital, Kediri, it was found that the family response time in the fast category was 11 respondents (36.7%).

According to the researcher, the cause of the delay in family response time in bringing stroke patients to the hospital is the family's trivialising attitude and lack of knowledge about early stroke detection. Therefore, families must be more aware of acting to immediately get help or first aid for stroke patients. This is in line with research from Santosa & Trisnain, 2019 which states that having more knowledge about early detection of stroke patients increases the prevention of the impact of stroke attacks (Santosa & Trisnain, 2019).

In addition to the lack of family knowledge, the distance travelled from the patient's home to the hospital also greatly affects the family's response time in bringing the patient to the hospital. Most of the respondents have a long distance from the

hospital, so it takes more than three hours to get to the hospital. This means that the farther the location of the incident with a hospital that has good handling facilities, the greater the chance of the patient losing the golden period.

This is in line with research from Prasetyo (2017), which states that there is a significant relationship between distance and patient delay in coming to the hospital. And several other things that cause delays in family response time, namely the family is still trying to find traditional medicine to cure the patient's illness (Huttami & Hidajah, 2020). According to researchers, there is a relationship between family response time in bringing stroke patients to the hospital related to the severity of stroke patients. This means that the faster and more accurate the response time of the family in bringing the patient to the hospital, it can reduce the severity of stroke patients, and vice versa.

Severity Level

Based on the researchers assessing the median value in table 5.3, the score of the severity of stroke patients brought to Haji Adam Malik Medan Hospital is 21 if categorised as being in the severe category. The results of research by Sholihah & Kanita (2022), showed that the most stroke patients with severe severity were 23 respondents (54.8%). Handling stroke patients is an emergency treatment in neurologic examination that must be carried out quickly, precisely, and thoroughly.

The examination can be carried out using the National Institute of Health Stroke Scale (NIHSS) format as a method of measuring the severity of stroke. The NIHSS scale has a minimum value of 0 and a maximum of 42. As with the research of Shariyani, L., & Rachmania, D. (2021), the criteria for the NIHSS scale format state an assessment of mild severity (1-4), moderate severity (5-15), severe severity (16-20), and very severe severity (21-42).

According to researchers, the severity of the patient may be influenced by the patient's age. In this study, the average age of patients treated was 58 years old. One of the risk factors for stroke patients is age, so the increasing age, the greater the risk of stroke. All organs of the body, including the blood vessels of the brain, are a process of increasing age associated with the ageing process, which leads to an increase in the frequency of stroke (Audina & Halimuddin, 2017).

In addition to age, a history of diseases such as hypertension, hypercholesterol, hyperthyroidism, heart disease, kidney infection, and more than one stroke attack are also risk factors that can affect the severity of stroke patients. Stroke patients who have a history of hypertension have a 16.22-fold higher risk of having a stroke than patients who do not have a history of hypertension (Audina & Halimuddin, 2017). One of the important keys to minimising brain damage or neurological deficits is to provide fast and appropriate treatment. Because with fast treatment the patient will quickly get oxygenation (Alif Irsyam et al., 2022).

According to the researcher, the severity of stroke patients is severe due to ignorance and underestimation of the family regarding the initial symptoms of stroke, making the family late in bringing stroke patients to the hospital. In addition, it can also be due to the patient's late arrival to the hospital, which can aggravate the patient's condition.

Relationship between Family Response Time and Severity

The results of this study indicate a sig. (2-tailed) value of 0.008 so that if the sig value is 0.05, it can be concluded that there is a significant relationship or the

relationship between family response time in bringing stroke patients with the severity of stroke patients at H. Adam Malik Medan General Hospital in 2023, with a correlation coefficient of 0.441, which means a positive relationship with a unidirectional relationship or means that if the family response time variable is getting longer, the severity of stroke patients is getting heavier and the strength of the relationship is moderate. This is in line with the research of Ishariani et al., (2019) which shows a p-value = 0.000 so that there is a relationship between the golden period and the degree of neurological damage in ischemic stroke patients in the Emergency Room of the Bukittinggi National Stroke Hospital in 2018.

This is also in accordance with Sholihah & Kanita's, (2022) research where there is a relationship between response time and the severity of patients in the Emergency Department of Dr. Moewardi Surakarta Hospital with a sig value. (2-tailed) 0.000 and the correlation coefficient is -0.724. In addition, the results of research (Firdaus, 2023) show a p-value of 0.000 <0.05 which states that there is a significant relationship between pre-hospital delay and the severity of stroke patients in Banjarmasin city hospitals.

The researcher assumes that the family's response time in bringing stroke patients to the hospital can affect the severity of stroke patients. So, the faster the family's response time in bringing stroke patients to the hospital, the lighter the severity experienced by stroke patients. Family response time in bringing patients to the hospital has a moderate relationship to the condition of stroke patients, which can be seen from the measurement of the severity of stroke patients.

CONCLUSION

Based on the results of this study, it can be concluded that the family's response time in bringing stroke patients to the hospital at H. Adam Malik Medan General Hospital is still relatively slow, as seen from the length of time the family brings the patient to the hospital past ≤ 3 hours (golden period). This can worsen the patient's condition so that it can be seen from the score of the severity of stroke patients through observation of NIHSS measurements at H. Adam Malik Medan Hospital in 2023 at a score of 21 in the severe category. The results of these findings can be concluded that there is a relationship between family response time in bringing stroke patients to the hospital associated with the severity of stroke patients. This means that the faster and more precise the family's response time in bringing the patient to the hospital, it can alleviate the severity of stroke patients, and vice versa.

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The results of this study are expected to be used as a new source of knowledge for the family, and it is also hoped that the results of this study can be used as a reference by the family about the importance of family response in bringing stroke patients to the hospital and being able to perform early treatment with early detection of FAS so that rapid and appropriate treatment will increase success in the treatment of stroke patients, minimise the severity of stroke patients, and minimise death in stroke patients.

Health workers are expected to provide education to the public about prehospital or early detection in stroke patients and their families. For researchers who want to continue further research on the response time and severity of stroke patients, it is advisable to conduct implementation in several research locations in order to obtain sufficient samples.

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