

## The Relationship between Demographic Characteristics and Family Knowledge Level toward The Golden Hour of Stroke Patients

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### Abstract

Stroke is a time-critical emergency condition and urgent; if the stroke patient arrives within 3-4.5 hours, treatment can be started immediately upon arrival, decreasing the disability and mortality rate. Family demography characteristics may influence of care seeking-decision, including age, gender, education level, and income level. In addition, the level of knowledge of the family in recognising the appropriate health problems when the patient has a stroke. The study aimed to determine the relationship between demographic characteristics and the level of family knowledge regarding the golden hour for stroke patients. This study was an observational, correlational, analytical study using a cross-sectional study technique with consecutive sampling of 41 respondents. The results of the study showed that the majority of families were aged 36-45 years (29.3%), the majority were female (63.4%), the majority had a high school education (24.4%), the majority had income less than 1.500.000 rupiah (51.2%), and the majority had a good level of knowledge (63.4%). The golden hour for stroke patients was mostly <4.5 hours (63.4%). The results of the analysis show that there is no relationship between age, gender, income, and family knowledge level with the golden hour, with a p-value > 0.005. However, there is a relationship between education level and the golden hour, with a p-value of 0.01. Suggest: Education level was significantly associated with immediately time arrival.

**Keywords:** Golden hour, Stroke, Demographic characteristics, Knowledge

### Introduction

Stroke is a major health issue. Stroke is the second leading cause of death, following heart disease, and the third leading cause of disability worldwide (Avan & Hachinsky, 2021). The demographic characteristics of the family bringing the stroke patient may also influence the decision to take the patient to the hospital. Stroke patient characteristics are included in demographic factors, which include age, gender, level of education, and income level (Wardhani and Martini, 2015). Demographic characteristics are a primary factor in a family's decision to take a patient to the hospital, such as the age of the family, where the older the age, the more mature the emotions of a person (Abdul Halain et al., 2022).

According to World Stroke Organization figures, there are 13.7 million new cases of stroke each year, and around 5.5 million deaths from this condition (Ali et al., 2023). In 2013, globally, nearly 25.7 million people suffered from stroke, 71% with ischemic stroke and 29% with hemorrhagic stroke, with a mortality rate of 6.5 million people, 51% with ischemic stroke and 49% with hemorrhagic stroke, with the number of disabilities due to stroke reaching 113 million people, 58% with ischemic stroke and 42% with hemorrhagic stroke (Pamungkas and Dewi, 2020). Meanwhile, in 2018, In Indonesia, the

prevalence of stroke was 10.9 per 1.000 people, a reduction over the preceding five years (Putri, 2023). According to the 2018 Basic Health Research (Riskesdas), the prevalence of stroke cases in East Java was 12.4 per thousand population (Ministry of Health RI, 2018). Meanwhile, stroke cases increased from 12.1% in 2020 to 14.9% in 2021 (Ali et al., 2023). The prevalence of stroke in East Java in 2021 was 12.4%, which is above the national average. According to previous data, Malang Regency had the highest number of stroke cases, with 1.218 cases in East Java (Putri, 2023).

Stroke is an emergency. The sooner the family takes the patient to the hospital, the sooner treatment is provided, and the better the outcome, resulting in reduced disability and mortality rates (Ishak, Yueniwati & Kapti, 2020). Previous studies have found that the recommended family response time for stroke patients is within the golden hour, which is 3-4.5 hours (Okraeni, 2018). The golden hour is highly effective for the primary goal of stroke treatment, which is to save brain tissue suffering from a lack of nutrients and oxygen. However, many of the biggest obstacles can be caused by the family's lack of knowledge and perception of recognizing stroke symptoms (Khandelwal et al., 2025).

Based on the above background, some families still tend to delay going to the hospital due to low knowledge and awareness of stroke emergencies (Wang et al., 2021). Increasing family awareness of risk factors and warning signals of stroke will increase their response to rapidly transfer stroke patients to the hospital. Furthermore, a positive perception of stroke emergencies will also increase the rate at which patients arrive at the hospital. Other factors, including family demographic characteristics, additionally affect how quickly patients arrive at the hospital, including age, gender, education level, distance from residence to the hospital, and economic factors.

Therefore, based on the above explanation, this researcher aims to demonstrate through testing, as an extension of previous research, that there is a correlation between demographic characteristics and family knowledge regarding the golden hour for stroke patients.

**Materials and Methods**

The research design used a cross-sectional study with a correlational, observational research design. The study was conducted at Karsa Husada Regional Hospital in Batu City from March 6 to April 6, 2024. The population in this study were families of stroke patients who came to bring patients to the hospital's emergency room. The number of samples was 41 people, and they had met the research criteria, taken using consecutive sampling techniques. The inclusion criteria in this study were (1) families of stroke patients who were hospitalized or patients admitted through the emergency room, (2) families of stroke patients who experienced their first attack who came to the hospital, (3) friends or relatives or neighbors who brought stroke patients to the hospital's emergency room, (4) willing to be respondents, (5) respondents aged over 17 years, (6) families who were present when the stroke attack occurred, able to read, write. The exclusion criteria for the study were: (1) families of patients with a second stroke attack, (2) did not complete a series of studies.

This study's instruments included a questionnaire on family demographic factors such as age, gender, education level, and income. Meanwhile, to assess the accuracy of the golden hour, an observation sheet was used. Meanwhile, to measure family knowledge, the Stroke Recognition Questionnaire (SRQ) and the AHA guidelines for early stroke management developed by Rosmary & Handayani (2020) were used. This questionnaire consisted of 39 items with a validity of >0.361 and a Cronbach's Alpha of 0.92. Data were analyzed using the Chi-square test. Research data were collected with due regard for research ethics by conducting Informed Consent, maintaining privacy, and the principles of justice and beneficence.

**Results**

According to Table 1, there is no link between family age and the golden hour of stroke patients (p-value > 0.05).

Table 1. The relationship between family age and the golden hour of stroke patients

Age	Golden Hour	Total	p-Value
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	More than 4.5 hours		Less than 4.5 hours		f	%	p-Value
	f	%	f	%			
Late adolescence	3	7.3	5	12.2	8	19.5	0.590
Early Adulthood	5	12.2	4	9.8	9	22.0	
Late Adulthood	5	12.2	7	17.1	12	29.3	
Early Old Age	1	14.6	6	14.6	7	17.1	
Late Old Age	2	4.9	2	4.9	4	9.8	
Old Age	0	2.4	1	0	1	2.4	

\*Chi-square test

Based on the data in Table 2, the p-value is more than 0.05, indicating that there is no association between family member gender and stroke patients' golden hour.

Table 2. The relationship between family gender and the golden hour of stroke patients

Sex	Golden Hour				Total	p-Value	
	More than 4.5 hours		Less than 4.5 hours				
	f	%	f	%			
Male	7	17.1	8	19.5	15	36.6	0.309
Female	9	22.0	17	41.5	26	63.4	

\*Chi-square test

Table 3 shows a significant connection (p-value <0.05) between family education and stroke patients' golden hour at Karsa Husada Regional Hospital, Batu City.

Table 3. The relationship between family education level and the golden hour of stroke patients

Educational level	Golden Hour				Total	p-Value	
	More than 4.5 hours		Less than 4.5 hours				
	f	%	f	%			
Elementary School	2	4.9	8	19.5	10	24.4	0.004
Middle School	2	4.9	7	17.1	9	22	
High School	9	22	4	9.8	13	31.7	
University	3	7.3	6	14.6	9	22	

\*Chi-square test

Based on Table 4 below, the results show a p-value >0.05, which indicates that there is no relationship between family income levels and the golden hour of stroke patients at Karsa Husada Regional Hospital, Batu City.

Table 4. The relationship between family income and the golden hour of stroke patients

Income	Golden Hour				Total	p-Value
	More than 4.5 hours		Less than 4.5 hours			
	F	%	f	%		
<1.5 million	8	19.5	13	31.7	21	51.2
1.5-2.5 million	2	4.9	9	22	11	26.8
2.5-3.5 million	5	12.2	1	2.4	6	14.6
> 3.5 million	1	2.4	2	4.9	3	7.3

\*Chi-square test

According to Table 5, the p-value is greater than 0.05, showing that there is no association between the level of family knowledge and the golden hour of stroke patients at Karsa Husada Regional Hospital in Batu City.

Table 5. The relationship between family knowledge and the golden hour of stroke patients

Stroke knowledge	Golden Hour				Total	p-Value
	More than 4.5 hours		Less than 4.5 hours			
	f	%	f	%		
Poor (≤60)	6	14.6	11	26.8	17	41.5
Good (>60%)	10	24.4	14	34.1	24	58.5

\*Chi-square test

**Discussion**

Based on the results of this study, age, gender, and family income level showed no significant relationship with the golden hour (p-value >0.05). Meanwhile, education level showed a significant relationship with the golden hour in stroke patients (p < 0.05). These results align with a previous study that found that age was not significantly associated with the delayed arrival of stroke patients at the hospital (p-value >0.05) (Syamsuddin et al., 2024). This study also aligns with research conducted by Al Khathaami et al. (2018), which discovered that age had no significant influence on the delayed arrival of stroke patients at the hospital (p>0.05).

Based on gender, the results of this study are consistent with prior research that found no association between gender and the golden hour of stroke patients at Bangil Regional Hospital (Sumarsono, 2019). Meanwhile, based on the level of education, the results of this study are consistent with earlier studies, indicating the level of education of the family of stroke patients is substantially connected to delays in the golden hour of stroke patients (p-value = 0.000) (Mohtar, 2019).

Based on income level, the results of this study are consistent with research conducted in Bukit Tinggi, showing there is no significant association between income level factors and the golden hour of stroke patients to the Emergency Room, with a p-value = 0.235 (Kurnia et al., 2023). The findings of this study are consistent with studies conducted in Pasuruan, which found no significant association between family income level and the late arrival of stroke patients (Prayitno & Fitriani, 2025).

According to the researcher's assumption that the age of the family with the golden hour of stroke patients is not related, one of the factors is because more than one family member brings the patient, in addition, the family age factor influences how to make decisions and awareness of stroke symptoms in patients so that they bring patients to the hospital within the golden hour limit which can also affect the results of research findings. In addition, patients who suffer from stroke are mostly men, so the families who bring patients to the hospital and who look after patients in the hospital are mostly their wives and children. In addition, many families use BPJS health to cover the cost of treatment while in the hospital, so that families do not worry about the costs that will be incurred in the hospital.

The study found no significant association between family knowledge of stroke and the golden hour of stroke patients. The results of the study are consistent with prior studies showing there is no significant association between the level of knowledge and the time of arrival of the family bringing the patient after an ischemic stroke to the emergency room (Kurnia et al., 2023). According to researchers, family knowledge levels have no statistical relationship to the golden hour. However, the study findings are noteworthy considering the high proportion of accurate golden hour occurrences, as well as the high level of family knowledge. The accurate golden hour occurrence rate among the population with a high level of knowledge in the study was 41.5%. This is influenced by the fact that many families are aware that if a family member experiences a serious illness or sudden unconsciousness, they will immediately take them to the hospital.

This study has several limitations. One is that the measurement of family knowledge levels was conducted using a self-reported questionnaire, which could potentially lead to response bias, either in the form of overestimation or underestimation. Second, this study did not consider other factors that could potentially influence delays in reaching the golden hour, such as distance to health facilities, referral systems, transportation availability, social support, cultural factors, and family perceptions of early stroke symptoms. Third, the characteristics of the respondents were limited to one hospital, and the sample size was small, making it impossible to generalize to the wider population.

**Conclusion**

There was no significant relationship between demographic variables such as age, gender, income level, and family knowledge about stroke and the golden hour at Karsa Husada Regional Hospital, Batu. However, there was a significant correlation between education level and the golden hour at Karsa Husada Regional Hospital in Batu City.

The results of this study indicate that family education level is significantly associated with achieving the golden hour in stroke patients. This finding indicates that education level plays a role in the family's ability to understand emergencies and make quick decisions regarding stroke treatment. It is recommended that further research assess other variables, such as access to healthcare, referral systems, family support, and cultural factors that may influence delays in stroke treatment.

## ADDITIONAL INFORMATION

### Data availability statement

The data is entirely owned by the researcher and can be accessed with the researcher's consent.

### Conflict of Interest

The author states that there are no financial or non-financial conflicts of interest that influenced the research implementation process, data analysis, or writing of the article.

### Author Contribution

SW was involved in the concept formulation and design. TD was

responsible for data collection and analysis. NW, IRN wrote the manuscript's draft. All writers read and approved the manuscript's final version.

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