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Research Article

Association between Self-Awareness in Controlling Stroke Risk Factors and Recurrent Stroke Incidence: A Cross-Sectional Study

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ABSTRACT

Stroke remains a major cause of disability and mortality worldwide. Recurrent stroke is strongly associated with inadequate control of modifiable risk factors, which may be influenced by patients' self-awareness. This study aims to examine the association between self-awareness in controlling stroke risk factors and recurrent stroke incidence among stroke patients. A quantitative cross-sectional study was conducted at the Neurology Polyclinic of Bukittinggi Brain Hospital in 2025. A total of 100 stroke patients were recruited using non-probability accidental sampling. Data were collected using a validated self-awareness questionnaire. Statistical analysis was performed using the chi-square test, with odds ratio (OR) estimation. Most respondents had low self-awareness (76.0%). A significant association was found between self-awareness and recurrent stroke incidence (p = 0.002). Patients with low self-awareness were more likely to experience recurrent stroke (OR = 5.143). Low self-awareness in controlling stroke risk factors is significantly associated with recurrent stroke incidence. Strengthening patient-centered health education focusing on self-awareness may contribute to secondary stroke prevention.

INTRODUCTION

According to *world Health Organization* (WHO) explained that stroke is a disease that can cause disability and death, occurs due to a disorder of nervous system function that occurs suddenly and is caused by disorders of blood circulation to the brain is disrupted, disorders of brain blood circulation can lead to blockage of cerebral vessels (ischemic) or rupture of blood vessels in the brain (hemorrhagic) (WHO, 2021)

Strokes are generally categorized into two types: hemorrhagic and non-hemorrhagic (ischemic). Hemorrhagic stroke occurs when blood vessels rupture, leading to impaired blood flow to the brain. Conversely, non-hemorrhagic or ischemic stroke results from a blockage in blood vessels, causing blood flow to the brain to be partially or entirely halted (Rizaldy et al., 2016).

Risk factors for stroke themselves are divided into two groups, namely non-modifiable (irreversible) risk factors consisting of age, gender, race, family history, and previous stroke history and modifiable risk factors consisting of hypertension, diabetes, and dyslipidemia. (Rizaldy et al., 2016).

The impact and consequences that can occur due to non-compliance in controlling stroke risk factors, namely speech disorders, headaches, weakness of the upper and lower extremities and reduced memory and in stroke patients will also have a varied impact of the disorder, depending on the part of the brain affected. Stroke patients will experience partial body paralysis, aphasia, *facial drop*, weak arms and legs, impaired body coordination, mental changes, emotional disturbances, impaired communication and loss of sense of taste. As a result of these changes, it will have a negative impact on the quality of life of patients because it can interfere with daily life activities (Rizaldy et al., 2016).

Based on data from *word health organization* (WHO, 2020), globally there are around 27,000 thousand cases of stroke out of 100,000 thousand population, and 6,100 thousand people died in 2020 (Dwilaksono et al., 2023). Meanwhile, based on data *World Stroke Organization* (WSO, 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 alive today. And about 795,000,000 people suffered new or recurrent strokes, of which about 610,000,000 people had first-time strokes, while 185,000,000 people had recurrent strokes (Dwilaksono et al., 2023).

According to data from Basic Health Research (Riskesdas, 2020), stroke is Indonesia's leading cause of death at 15.4%. Annually, there are approximately 750,000 stroke cases, with 200,000 being recurrent (Lola, 2020). In West Sumatra, stroke ranks 6th among causes of death out of 33 provinces, accounting for 10.6% of cases, affecting a total of 35,108 individuals (Zaffarsyah et al., 2024).

Based on the 2023 *Medical Record* data at the Bukittinggi Brain Hospital, the incidence of stroke from year to year increased, the incidence of stroke in 2023 from January to December was found in 9,072 outpatient cases at Bukittinggi Brain Hospital and 4,561 people were hospitalized. And the latest stroke data from the *Medical Record* in 2024 from January to June the incidence of stroke in the inpatient and outpatient rooms of the Bukittinggi Brain Hospital is around 2,466 cases, including ischemic stroke data with an average monthly of approximately 145 people.

From the data above, stroke is one of the most dangerous diseases in the world and a person who has had a stroke has a greater risk of having a recurrent stroke. A recurrent stroke is a condition when a person has another stroke after the first stroke. Repeated strokes have a heavier impact than the first attack because the disability disorder experienced will be more severe. (Ekawati et al., 2021).

According to Widiastuti, the results of the study on the prevention of recurrent stroke, stated that stroke risk factors also apply to the incidence of recurrent stroke. The impact of stroke is not only disability but also tends to be recurring, recurrent strokes vary, it is estimated that people who recover from the first stroke will get a recurrent stroke within 5 years or faster depending on the patient's understanding and awareness of stroke risk factors, especially risk factors that can be modified (Yardes et al., 2022)

In order for stroke sufferers not to easily experience recurrent strokes, it is important for post-stroke sufferers to prevent the risk of recurrent stroke by increasing *self-awarness*

(self-awareness), self-awareness is the ability to know oneself, not only about one's shortcomings and advantages, but all things related to ourselves, so as to understand our feelings, what we think, and then do ourselves well. (Agustina et al., 2023).

Activities *self-awareness* In stroke patients, it is everything related to the patient's efforts in self-management in maintaining effective behavior to control stroke risk factors, in order to avoid repeated strokes (Sapang et al., 2023).

To be able to reduce the incidence of stroke in Indonesia can be done by increasing *self-awareness* in a person in controlling stroke risk factors to reduce the incidence of stroke. Based on the description above, the researcher wants to conduct a study on whether there is a "Relationship *between Self-awarness* in Controlling Stroke Risk Factors and Recurrent Stroke Incidence at the Bukittinggi Brain Hospital Neoclinic in 2025"

METHOD

This study employed a quantitative cross-sectional design conducted from January to March 2025 at the Neurology Polyclinic of Bukittinggi Brain Hospital.

The population consisted of all stroke patients attending the clinic during the study period. A total of 100 respondents were selected using non-probability accidental sampling. Inclusion criteria were diagnosed stroke patients, aged ≥18 years, and willing to participate. Patients with cognitive impairment or severe communication disorders were excluded.

Data were collected using a self-awareness questionnaire consisting of 17 items covering risk factor control behaviors. The instrument had been tested for validity and reliability, with a Cronbach's alpha value >0.70, indicating acceptable internal consistency.

Data collection procedures included informed consent, questionnaire administration, and medical record verification. Statistical analysis was conducted using the chi-square test to assess associations, with odds ratio (OR) and 95% confidence interval (CI) estimation.

Ethical approval was obtained from the institutional ethics committee of Perintis University of Indonesia. All participants provided written informed consent prior to data collection.

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RESULT

Table 1. Frequency Distribution of Stroke Respondents' Self-Awarness Level at the Neologic Polyclinic of Bukittinggi Brain Hospital

	Variable	n	(%)
Self-Awarness			
	High Self-Awarness	24	24,0%
	Low Self-Awarness	76	76,0%
Total		100	100,0%

Based on Table 1 above, out of 100 respondents, the results of stroke patients who had high *self-awarness* were obtained by 24 (24.0%) respondents while stroke respondents who had *low self-awareness* were 76 (76.0%) respondents.

Table 2. Distribution of Stroke Incidence Frequency of Stroke Respondents at the Bukittinggi Brain Hospital Neologic Polyclinic

	Variable	n	(%)
Kejadian Stroke			
	Not Recurrent stroke	46	46,0%
	Recurrent stroke	54	56,0%
Total		100	100,0%

Based on Table 2 above, out of 100 respondents for the incidence of non-recurrent stroke, there were 46 (46.0%) respondents, and recurrent stroke had a higher number of non-recurrent strokes, which was around 54 (54.0%) respondents.

Table 3. Distribution of Stroke Frequency Length of Stroke Respondents at the Bukittinggi Brain Hospital Neologic Polyclinic

	Variable	n	(%)
Lama Stroke			
	> 1 Year	25	25,0%
	≤1 year	75	75,0%
Total		100	100,0%

Based on Table 3 above, out of 100 respondents for a span of more than 1 year, there were 25 (25.0%) respondents, this value was very small from the time span of less than 1 year with a total of 75 (75.0%) respondents.

Table 4. Frequency Distribution of Stroke Patients' *Self-Awarness* in Controlling Stroke Risk Factors and Recurrent Stroke Incidence at the Neurology Polyclinic of Bukitinggi Brain Hospital

Self-Awareness Level	Non-Recurrent Stroke	Recurrent Stroke	Total	p-value	OR (95% CI)
	n (%)	n (%)	n (%)		
High	18 (75.0)	6 (25.0)	24 (100)	0.002	5.143
Low	28 (36.8)	48 (63.2)	76 (100)		
Total	46 (46.0)	54 (54.0)	100 (100)		

Based on table 4 Showing relationships *self-awarness* (self-awareness) of stroke patients in controlling stroke risk factors with the incidence of recurrent stroke at the Pulmonology Polyclinic of Bukittinggi Brain Hospital. The results of stroke patients who have *self-awarness* 24 (24.0%) respondents while stroke respondents who had *self-awarness* low 76 (76.0%) respondents. The results of the statistical test were obtained and the p value = 0.002, statistically it was found that there was a relationship between *self-awarness* (self-awareness) of stroke respondents in controlling stroke risk factors with recurrent stroke incidence. The results of the analysis obtained OR (Opportunity) = 5.143, meaning that respondents who have *self-awarness* were 5,143 times more likely to have a recurrent stroke than those who had *self-awarness* tall.

DISCUSSION

Analisa Univariat

a. Frequency distribution of the self-alert level of stroke respondents at the Bukittinggi Brain Hospital Neologic Polyclinic

Based on Table 5.1 above, out of 100 respondents, the results of stroke patients who had high *self-awarness* were obtained by 24 (24.0%) respondents while stroke respondents who had *low self-awareness* were 76 (76.0%) respondents.

The results of this study are in line with the results of the research (Agustina et al., 2023) The known distribution of behavioral frequencies shows that most of the 52.6%, namely as many as 20 respondents with negative behavior. Known relationship *self-awareness* with the behavior of preventing stroke complications in hypertensive patients at Ciawi Hospital. (Agustina et al., 2023).

The results of the study are in line with the results of the study (Ekawati et al., 2021) About S Relationship s*elf-awarness* with the incidence of recurrent stroke in patients with hypotension where the same results are obtained, namely the relationship between *self-awarness* with the incidence of recurrent stroke, where the results of this study also explain that *Self-Awareness* is the process of understanding oneself about one's thoughts, motivations and behavior towards something, then if one has *self-awaress* against the disease, then a person will try to control the disease (Ekawati et al., 2021).

The results of the study are in line with the results of the study (Dewi Ratih & Prabawati, 2022) shows the majority of respondents have *self-awareness* low (62.5%) and respondents had a slightly increased risk of prediabetes (34.4%) followed by a high risk of prediabetes (26.6%) (Dewi Ratih & Prabawati, 2022).

According to the researcher's assumption that respondents who have *less self-awareness*, due to lack of control of stroke risk factors (such as hypertension, diabetes, smoking, and obesity) this results in an increase in the incidence of stroke due to low *self-awareness* about stroke risk factors resulting in poor self-health management which will have an impact on increasing the incidence of stroke and

recurrent stroke. For stroke respondents who have high *self-awareness*, because respondents are able to control stroke risk factors (such as hypertension, diabetes, smoking, and obesity), this results in high *self-awareness* of respondents.

b. Distribution of the frequency of stroke incidence of stroke respondents at the Bukittinggi Brain Hospital Neologic Polyclinic

Based on Table 5.3 above, out of 100 respondents for the incidence of non-recurrent stroke, there are 46 (46.0%) respondents, and recurrent strokes have more than non-recurrent strokes, which is around 54 (54.0%) respondents.

The results of this study are in line with the research (Sapang et al., 2023) states that the lack of *self-awarness* (self-awareness) a person in maintaining stroke risk factors is very influential in the occurrence of stroke for a person, both the first stroke and the stroke patient to experience a recurrent stroke, most of the first stroke patients are caused by the main stroke risk factors, namely hypertension and many recurrent stroke patients due to lack of compliance in carrying out treatment (Sapang et al., 2023)

According to the researcher's assumption based on the analysis of related research results, the test results with proportional values show that the incidence of the first stroke is less than the incidence of recurrent stroke, the first stroke is a stroke that occurs to a person for the first time and generally respondents who have a stroke for the first time have less severity of disability while repeated strokes are attacks again after having a negative attack. First, and generally patients who experience recurrent strokes have more severe disabilities than the first stroke.

Based on the explanation above, this is in accordance with the results obtained where the incidence of recurrent stroke dominates the incidence of stroke in the Neurology Poly Room of the Bukittinggi Brain Hospital in 2025.

c. Distribution of stroke frequency length of stroke respondents at the Bukittinggi Brain Hospital Neologic Polyclinic

Based on Table 5.4 It can be seen from 100 respondents based on the table of stroke length above for a span of more than 1 year has a total of 25 (25.0%) respondents, this value is very small from the time span of less than 1 year with a total of 75 (75.0%) respondents.

The results of this study are in line with the research (Budi & Syahfitri, 2018) that some strokes are fatal in nature, while others cause permanent and temporary disability, this suggests that the longer time passes after the first stroke, the less the risk of dying from stroke (Budi & Syahfitri, 2018).

According to the researcher's assumption based on the analysis of related research results, the test results with proportional values showed that the frequency of the respondents' strokes in the Neurology Poly Room of Bukittinggi Brain Hospital dominated with a stroke range of less than 1 year, and it was found that respondents who had a stroke range of less than 1 year experienced less impact due to stroke.

Based on the explanation above, this is in accordance with the results obtained where the incidence of stroke is less than 1 year more than the incidence of recurrent stroke in the Neurology Poly Room of the Bukittinggi Brain Hospital in 2025.

Analyzes Bivariat

a. Frequency Distribution of Stroke Patients' *Self-Awareness* Relationship in Controlling Stroke Risk Factors with Recurrent Stroke Incidence at the Neurology Polyclinic of Bukitinggi Brain Hospital

The relationship between *stroke patients' self-awareness* in controlling stroke risk factors and the incidence of recurrent stroke at the Bukittinggi Brain Hospital Neurology Polyclinic was obtained.

Based on table 5.5, it shows the relationship between *stroke patients' self-awareness* in controlling stroke risk factors and the incidence of recurrent stroke at the Bukittinggi Brain Hospital Neurology Polyclinic. The results were obtained from stroke patients who had high *self-awareness* in 24 (24.0%) respondents while stroke respondents who had low *self-awareness* were 76 (76.0%) respondents. The results of the statistical test were obtained with a p value = 0.002, statistically it was found

that there was a relationship between *the self-awareness* of stroke respondents in controlling stroke risk factors and the incidence of recurrent stroke. The results of the analysis obtained OR (Chance) = 5.143, meaning that respondents who have *low self-awarness* have a 5.143 chance of experiencing a recurrent stroke compared to those who have high *self-awarnation*.

The results of this study are in line with the results of the research (Agustina et al., 2023) The known distribution of behavioral frequencies shows that most of the 52.6%, namely as many as 20 respondents with negative behavior. Known relationship *self-awareness* with the behavior of preventing stroke complications in hypertensive patients at Ciawi Hospital. Based on the results of the statistical test using kendall tau, the result was a p value of 0.000 (<0.05). Since the p value < 0.05, Ho is rejected and Ha is accepted, so it can be concluded that there is a relationship *Self-Awarness* with the behavior of preventing stroke complications in people with hypertension(Agustina et al., 2023).

The results of the study are in line with the results of the study (Ekawati et al., 2021) About S Relationship*elf-awarness* with the incidence of recurrent stroke in patients with hypotension where the same results are obtained, namely the relationship between *self-awarness* with the incidence of recurrent stroke, where the results of this study also explain that *Self-Awareness* is the process of understanding oneself about one's thoughts, motivations and behavior towards something, then if one has *self-awaress* against his illness, a person will try to control his disease, (Ekawati et al., 2021).

The results of the study are in line with the results of the study (Dewi Ratih & Prabawati, 2022) shows the majority of respondents have *self-awareness* low (62.5%) and respondents had a slightly increased risk of prediabetes (34.4%) followed by a high risk of prediabetes (26.6%). Bivarate analysis shows that there is a meaningful relationship between *self-awareness* diet against the incidence of prediabetes (p <0.05). Conclusion The results of this study show that there are *self-awareness* diet related to the incidence of prediabetes in the working area of the Johar Baru Health Center, Jakarta (Dewi Ratih & Prabawati, 2022).

In this case, self-awareness is the ability to know oneself in managing risk factors that can result in the occurrence of a first stroke or a repeat stroke.

The results of this study also prove that out of 100 respondents, there are 76 people who have *self-awaraness* In the low category, According to interviews with respondents who had a stroke, they were not convinced that efforts to control risk factors could prevent complications so that they tended to be disobedient to taking medication and difficult to control their diet, unavoidable smoking habits to stress at work that they did not try to control, these are what trigger strokes. Then it is very much needed *Self Awareness* to be able to control risk factors so as to prevent the occurrence of stroke by increasing *Self Awareness* in him it seems to start from an effort to rediscover his feelings, an effort to know his own desires, determine the relationship with the aspect of self-unconsciousness and increase self-introspection (Ekawati et al., 2021).

According to the researcher's assumption that respondents who have *less self-awareness*, due to lack of control of stroke risk factors (such as hypertension, diabetes, smoking, and obesity) this results in an increase in the incidence of stroke due to low *self-awareness* about stroke risk factors resulting in poor self-health management which will have an impact on increasing the incidence of stroke and recurrent stroke, this is in accordance with the results A study of 17 *self-awareness* questionnaire statements, statement number 2 is a statement that generally respondents answer with a very low score, where the statement has questions about adherence to taking medication, and generally respondents answer sometimes obedient in taking medication, this is the cause of a person who can be very at risk of having a stroke. For stroke respondents who have *high self-awareness*, because respondents are able to control stroke risk factors (such as hypertension, diabetes, smoking, and obesity), this results in high *self-awareness* of respondents.

This self-health management can be initiated by self-awareness, self-awareness or *self-awareness* It is an ability to know ourselves, not only about our shortcomings and strengths, but all things related to ourselves, so as to understand our feelings, what we think, and then do ourselves well. Self-awareness or *self-awareness* is a state when a person is able to focus his attention on himself (Ns.ida zuhroidah et al., 2024).

CONCLUSION

Conclusion: Self-awareness in controlling stroke risk factors is significantly associated with recurrent stroke incidence. Patients with low self-awareness have a higher likelihood of experiencing recurrent stroke, underscoring the importance of self-awareness in secondary stroke prevention.

SUGGESTIONS

1. For Healthcare Professionals: Implement structured health education and counselling programs to enhance patient self-awareness and adherence to risk factor control.
2. For Educational Institutions: Integrate self-awareness and secondary stroke prevention topics into nursing curricula and continuing education programs.
3. For Future Researchers: Conduct longitudinal or interventional studies exploring psychosocial and family-related factors influencing self-awareness among stroke patients.

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