Factors Affecting Self-Management and Prevention of Recurrent Attacks in Post-Stroke Patients

Abstract

Background: An effective way to reduce mortality and complications of recurrent stroke attacks and improve the quality of life of stroke patients is by improving the patient's level of self-management. The complexity of stroke patients' problems can be handled with *self-management,* which plays an important role in daily activities, coping management, and stabilising conditions caused by chronic pain such as stroke.
Objectives: To know the factors affecting the *self-management* of stroke survivors to prevent and reduce the risk of recurring attacks.
Methods: This study used a descriptive-analytic design with a non-probability *consecutive* sampling technique involving 116 post-stroke respondents with a logistic regression test at one of the stroke foundations in Bali. The instrument used was a Stroke Self-Management Questionnaire. Furthermore, data analysis was carried out with Chi-Square for bivariate data and logistic regression for multivariate statistical analysis.
Results: Factors that influence self-management are education (p = 0.002), stroke attack (0.001), and medical history (0.011), with the strongest factor being the medical history (OR = 7.807) and the smallest being the education factor (OR = 2.136) with a probability that a patient has good self-management of 93.57%.
Conclusions: Medical history, level of education, and prior stroke experience are a few examples of the factors that affect how well stroke patients manage themselves. Medical history, particularly the history of hypertension, has the highest contribution to self-management to prevent and reduce the risk of recurrent attacks.

Keywords: risk factors, self-management, stroke, survivors.

Background

Stroke has become the leading cause of disability and death globally. As many as 85% of the total stroke cases that occur are ischemic strokes. This is because ischemic strokes often result in atherosclerosis, which worsens the patient's condition (1). In addition, stroke is the second-most common cause of death worldwide, resulting in 6.3 million fatalities. Globally, approximately 15 million individuals experience a stroke annually. Among these cases, one-third result in death, one-third lead to permanent disability, and 795,000 individuals experience either a first-time stroke or recurring attacks each year (2). Initial attacks are estimated to be around 610,000, with around 185,000 being recurrent attacks. Indonesia has the highest prevalence of stroke-related deaths, followed by the Philippines, Singapore, Brunei, Malaysia,

and Thailand. Asia has the second highest number of stroke survivors aged 60 years or older and the fifth highest number of stroke survivors aged 15–59 years (3). First-time stroke survivors have an increased risk of recurrent stroke that may result from the patient's failure to maintain regular self-monitoring. Research findings have demonstrated that approximately 25% of stroke patients suffer from recurrent episodes, with subsequent attacks carrying a higher risk of mortality compared to the initial occurrence (5). Post-stroke patients commonly experience a decrease in arm and leg movements (80%), cognitive impairments (80–90%), and memory issues (70%), and this phenomenon is a particular focus of attention as it is expected that the number of stroke patients experiencing recurrent attacks will increase, especially in developing countries (6).

The incidence and impact of recurrent strokes continue to rise significantly. Not only does this impact the individual experiencing the attack, but it also contributes significantly to the overall decline in the quality of public health. Recognising the high consequences of recurrent stroke, most of which lead to physical and cognitive impairment, the risk of dementia, and even death, further emphasises the urgency of paying greater attention to self-management efforts as a proactive measure in preventing stroke recurrence (7). The importance of self-management as a preventive measure against recurrent stroke has several aspects, namely monitoring and controlling risk factors such as high blood pressure, diabetes, and unbalanced cholesterol levels. Stroke patients need to regularly manage these conditions to ensure their health remains stable (8). In addition, lifestyle changes play a significant role in self-management. By adopting a healthy diet, undergoing regular physical activity, and avoiding smoking and excessive alcohol consumption, patients can reduce the risks that can trigger recurrent stroke attacks (9). Self-management also involves adhering to the medical professionals' recommended course of treatment. However, not all post-stroke patients have good self-management; some stroke patients have difficulty implementing self-management effectively, and some even have

difficulty carrying out optimal self-management so that it becomes a major factor from within that triggers recurrent attacks (10).

Individual traits that may influence how people react to and adhere to changes in self-management post-attack are just one of the many factors that affect how stroke patients manage their condition. Variability in health conditions and social support can affect patients' motivation and readiness to make changes in their lifestyle. Furthermore, accessibility to health services and information can also affect patients' ability to self-manage (11). Previous research has suggested that physical and biological factors, such as age, may influence stroke patients' self-management, but there is a need to further explore the factors that contribute to stroke patients' self-management and determine the dominant factors that influence post-stroke patients' self-management, as well as how these factors are interrelated in the context of post-stroke patients' self-management. These findings can certainly create innovative approaches to determining appropriate interventions for individual conditions (12).

Objectives

To know the factors affecting the *self-management* of stroke survivors to prevent and reduce the risk of recurring attacks.

Methods

Study design and participants

This research used a cross-sectional design. A consecutive sampling was conducted using Slovin's Formula (13) to recruit 116 post-stroke patients at one of the stroke foundations in Bali. The inclusion criteria in this study were stroke survivors with awareness of compos mentis and stroke survivors who could read and write and did not have visual impairments. Meanwhile, the exclusion criteria were stroke patients who experienced verbal communication disorders and hearing loss.

Data collection instruments

The questionnaire has two parts demographic and Stroke Self-Management Questionnaire (SSMQ) Demographic data used in this research instrument are gender, age, occupation, number of stroke attacks, and medical history. The SSMQ contains 31 statement items pertaining to various daily activities aimed at mitigating the risk of recurrent stroke and facilitating the reduction of both specific and general risks (14). Each statement is given 1 point that would have been totally accumulated, then divided into 2 categories: good self-management and poor self-management. The dimensions employed encompass stroke risk factors, the ramifications of stroke-related disability, and the provision of rehabilitation services within the healthcare sector. The survey instrument employs a Likert scale ranging from 1 to 4, where respondents indicate their level of agreement with statements that pertain to their present circumstances by selecting the most appropriate option, which includes strongly disagree, disagree, agree, and strongly agree. The scoring system involves a range of values, with the lowest score being 31 and the highest score being 124. These values are divided into two categories: poor, which includes scores ranging from 31 to 93, and good, which includes scores ranging from 94 to 124. The self-management questionnaire demonstrates a validity range of 0.482 to 0.961. The Cronbach's alpha reliability coefficient was found to be 0.909 (14).

Procedure

The manager provided a comprehensive explanation of the research to all attendees, then staff distributed questionnaires to the patient, who was accompanied by family. All participants were immediately instructed to fill out a questionnaire after signing the informed consent. The participants collected and stored the completed questionnaires in a secure container located at the receptionist. The aforementioned container was exclusively accessible to the individuals responsible for overseeing the administration of the research investigation.

Data analysis

The data obtained were tabulated and edited with SPSS Statistic 24 software. The data was then analysed univariately and bivariately. The univariate analysis aimed to describe the characteristics of the respondents (age, gender, education, job), brain attack, medical history, and self-management. It was presented in the form of a percentage distribution. Meanwhile, the multivariate analysis was aimed at identifying the factors influencing self-management using binomial logistic regression with a significance level of 95%.

Results

Based on the results in Table 1, the results showed that most of the samples were male, 75 people (64.7%), belonging to the middle age category, 81 people (69.8%), most of them worked, that is, 83 people (71, 6%), and have secondary school education up to 79 people (68.1%). Most of the samples had their first stroke, up to 62 people (53.4%). The medical history of most of the patients had a history of hypertension, up to 72 people (62.1%). The results of the self-management showed that most of the samples had good self-management, namely 95 people (81.9%), and 21 people (18.1%) had poor self-management.

Based on Table 2, it was found that in the gender characteristics of the sample, 61 men (52.6%) had good self-management, while women with good self-management had up to 34 people (29.3%). The good self-management in the middle age category is up to 66 people (56.9%), and 29 people are elderly (25%). The profession variable that has good self-management is mostly working, namely 70 people (39.7%). Regarding the characteristics of the type of education level, 53 people (45.7%) had good self-management in the category of not attending school or elementary education. The samples that had good self-management with having had a stroke for the first time were 58 people (50%), and 37 people (31.9%) had more than 1 stroke

attack. In the characteristics of the sample, people with a history of disease with good self-management (35.2%)

Based on Table 3, the results showed that the factors that influence self-management are education (p = 0.002), stroke (0.001), and medical history (0.011), with the strongest relationship being the medical history (OR = 7.807) and the smallest being the education factor (OR = 2.136), with a probability of 93.57% that patients have good self-management.

Discussion

The findings showed that medical history, education, and stroke attack influenced stroke survivors' self-management to prevent and reduce the risk of recurrent attacks. The most influential factor in the self-management of stroke survivors is the history of the disease. A history of hypertension dominated the respondents' medical histories. The results of this study are in line with Kim's research, which states that hypertension is a condition when blood pressure in the arteries increases chronically. High blood pressure can damage blood vessels throughout the body, including those in the brain. If hypertension is not well controlled through proper self-management, such as following prescribed medications, living a healthy lifestyle, and managing stress, then the risk of having a recurrent stroke will increase (2). This is the reason why medical history has the highest contribution to self-management in dealing with recurrent attacks. Having a history of the disease means that stroke survivors must control the risk factors more strictly and consistently (15).

Stroke survivors who had their first stroke showed good self-management in the results of this study, while poor self-management was described in stroke survivors who had more than one stroke. Conceptually, recurrent stroke increases the risk of more serious physical complications and the recurrence of more frequent sequelae, such as muscle weakness, impaired coordination, impaired speech, and sensory disturbances. These physical complications limit a person's

ability to manage themselves effectively (16). Good self-management occurs mainly in stroke survivors who have no history of disease, and poor management is experienced by stroke survivors who have a history of disease (17). A history of stroke survivors such as hypertension, diabetes mellitus, and high cholesterol (hyperlipidaemia) is a chronic disease with long-term complications in the body of a person. As with hypertension, it can damage blood vessels, including the arteries of the brain, which can be regarded as a stimulus for a stroke (15).

A person's life balance is also usually inseparable from the level of education possessed; in this study, the educational level of respondents who had good self-management was in the category of not going to school or education, while poor self-management was even in further education (18). This creates frustration or difficulty accepting the change, which can have a negative impact on self-management. Klockar's research also states that stroke survivors who have advanced education are more unprepared to accept changes in their condition. This can be related to the fact that people who have education tend to have high expectations of themselves, and if they have a stroke and face difficulties in recovery, they will be prone to depression and anxiety. This emotional disturbance can also affect their motivation and ability to perform effective self-management (19).

The self-management of post-stroke patients can be influenced by several things that can lead to good or poor self-management. Based on the results of statistical tests, it can be described that men tend to have a higher percentage of poor self-management than women when they have a stroke. This can happen due to two aspects, namely psychologically or physically. This is also reinforced by research conducted by Cheong, who states that men who have had a stroke have a higher rate of depression than men who have not had a stroke. women because it is related to their self-esteem in carrying out their duties in the family; only if this continues to happen, it does not deny that the patient's self-management is getting worse in coping with stroke. (18) Meanwhile, when viewed from an age perspective, poor self-management tends to

be experienced by stroke survivors in the middle age range of 40–59, which is an age that is still productive and not yet retired. In contrast to stroke survivors who are older and more able to accept their condition because they are no longer subject to family obligations, disrupted productivity at this age will undoubtedly have a significant negative impact on the stability of family life in relation to the existence of moral or material responsibility. These survivors view these attacks as a degenerative process in their advanced age. This reason is reinforced by Satink's research, in which productive age has a longer adaptation time to accept changes within it, or there is a reason that the partner they have can leave them when diagnosed with a stroke, making self-management worse (20). But the results of a different study revealed by Kuo that people of productive age actually have good self-management because they are motivated to recover soon and can continue working to fulfil their obligations (21). This proves that the self-management of stroke patients is not only related to self-adaptation but can also be influenced by the surrounding environment.

Good self-management can also arise from a good work environment, but in this study, poor self-management was dominant among stroke survivors. The analysis results from La Torre's research also reinforce the fact that a worker has more responsibility, not only related to the economic needs of his family but also to the leadership and the agency where he works (21). High-stress and high-stress jobs can increase a person's risk of having a stroke. Chronic stress can lead to increased blood pressure, inflammation, and disruption of the cardiovascular system, which are major risk factors for stroke. In a busy working environment, it is often difficult for workers to take the time to take care of themselves.

Recurrent stroke attacks are, of course, currently a special concern not only for stroke survivors and their families but also for health services, especially nurses. In this study, factors that influence self-management and have an impact on the occurrence of repeated attacks were found. These factors include education, stroke, and a history of disease. The greatest strength

of the relationship is stroke survivors who have a history of disease, and the smallest is the education factor (22). Education in this case has the least influence on poor self-management, which can lead to repeated attacks, because good understanding can actually make a person do good self-management, too, although in this study it was shown that stroke survivors who had advanced education had poor self-management. However, it cannot be denied that someone who has a good education and a good understanding understands the conditions they are experiencing and has a higher awareness of the importance of managing themselves and taking the necessary steps for good self-management to reduce the risk of attacks being repeated (23). Respondent autonomy may be one of the limiting factors in this study. Some patients who have physical or cognitive limitations may be unable to provide accurate or complete responses regarding self-management and efforts to prevent recurrent attacks.

Conclusions

Medical history, level of education, and prior stroke experience are a few examples of the factors that affect how well stroke patients manage themselves. Medical history, particularly a history of hypertension, has the highest contribution to self-management to prevent and reduce the risk of recurrent attacks. It is important to understand and consider these factors in designing appropriate interventions and support to improve stroke patients' self-management. A personalised approach and tailoring of self-management strategies based on medical history, education level, and stroke experience may help improve the effectiveness of recurrent attack risk prevention and management efforts in post-stroke patients.

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Competing interests

The authors do not have any conflicts of interest in the conduct of this research.

Authors' contributions

All authors read and approved the final manuscript. All authors are accountable for the data's integrity and the accuracy of the data analysis.

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Availability of data and materials

The datasets are available from the corresponding author upon reasonable request.

Ethics, approval, and consent to participate

Throughout the course of this investigation, we maintained our commitment to upholding the ethical standards outlined in the Declaration of Helsinki. Ethical clearance was reviewed and approved by Wira Medika Bali Ethic Commission Number 117/E1.STIKESWIKA/EC/IV/2023, which was approved on April 23, 2023. Before enrolling in the research study, each participant provided written informed consent.

Consent for publication

The authors affirm their consent for the final accepted version of the manuscript to be considered for publication by submitting this document.

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Table 1. Frequency distribution of respondents

Items	n	%
Gender		
Man	75	64.7
Woman	41	35.3
Age		
Middle-aged	81	69.8
Elderly	35	30.2
Job		
Unemployment	33	28.4
Employment	83	71.6
Education		
No school / elementary school	37	31.9
High school	79	68.1
Stroke attack		
First time	62	53.4
>1 times	54	46.6
Medical history		
No history	44	37.9
Hypertension	72	62.1
Self-management		
Good	95	81.9
Poor	21	18.1

Table 2. Cross-table and Chi-square test

	Self-Management				P Value
	Good		Poor		
	n	%	n	%	
Gender					
Man	61	52.6	14	12.1	0.834
Woman	34	29.3	7	6.0	
Age					
Middle-aged	66	56.9	15	12.9	0.862
Elderly	29	25.0	6	5.2	
Job					
Unemployment	25	42.2	5	4.3	0.021
Employment	70	39.7	13	13.8	
Education					
No school /elementary school	53	45.7	5	4.3	0.008
High school	42	36.2	16	13.8	
Stroke attack					
First time	58	50.0	4	3.4	0.000
>1 times	37	31.9	17	14.7	
Medical history					
No history	41	35.3	3	2.6	0.014

There is a history of disease	54	46.6	18	15.5	

Table 3. Logistic regression table of factors that affect self-management.

	Variable	Coefficient	*p*	OR (95% CI)
Step 1	Job	1,886	0.202	2,412 0.106-6.329
	Education	1,579	0.026	2,206 0.051-7.221
	Stroke attack	2,056	0.002	4,128 1035-7,899
	Medical history	2.014	0.007	6,133 1.031-9.676
	Constant	-2,756	0.000	0.004
Step 2	Education	1,993	0.002	2,136 0.039-8.334
	Stroke attack	2.107	0.001	4,122 1.034-10.776
	Medical history	2,890	0.011	7,151 1.035-9.707
	Constant	-2,571	0.000	0.002

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