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Factors influencing self-management for preventing recurrent stroke attacks among patients at the stroke foundation clinic in Bali, Indonesia, 2023

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Abstract

Background: Effective self-management practices post-stroke have been shown to decrease mortality rates and enhance the quality of life for patients. While existing studies have explored various factors impacting self-management, further investigation is necessary to identify key determinants that influence self-management and aid in preventing recurrent strokes.

Objectives: This study aims to identify the factors that influence self-management among stroke survivors to prevent recurrent attacks.

Methods: A cross-sectional study was conducted in April 2023 a stroke foundation in Bali, Indonesia, involving 116 post-stroke patients recruited through non-probability consecutive sampling. Data collection utilized the Stroke Self-Management Questionnaire, with analysis performed using chi-square and logistic regression methods.

Results: Gender and age did not exhibit significant associations with self-management. However, regression analysis revealed that education (P=0.002, OR=2.136), previous stroke history (P<0.001, OR=4.122), and pre-existing medical conditions (P=0.011, OR=7.151) were significantly correlated with self-management.

Conclusion: The study highlights the significance of education level, prior stroke experience, and comorbid conditions as influential factors affecting self-management and the likelihood of recurrent stroke attacks. Understanding these determinants is crucial for designing tailored interventions and support systems to enhance self-management practices in stroke patients.

Keywords: Risk Factors, Self-Management, Stroke, Survivors.

Introduction

Stroke is a prevalent cause of disability and mortality on a global scale, with approximately 85% of all strokes being ischemic strokes attributed to atherosclerosis.[1] Data from the World Stroke Organization in 2022 revealed that there are over 12.2 million new stroke cases annually, affecting one in four individuals over the age of 25 during their lifetime.[2] Tragically, one-third of stroke cases result in death, while another third lead to permanent disabilities. Projections indicate that stroke rates in the United States are expected to rise by 3.4 million by 2030.[3] Recurrent strokes accounted for more than 30% of all stroke incidents worldwide in 2019, underscoring the persistent threat of stroke recurrence.[4] Indonesia reported an incidence rate of 2,097.22 strokes per 100,000 individuals in the same year, with the country exhibiting the highest stroke-related mortality rate in Asia, followed by several other nations.[5,6]

Survivors of initial strokes face an increased risk of recurrent strokes, potentially stemming from inadequate self-monitoring practices. Studies have shown that approximately 25% of stroke survivors experience recurrent attacks, which carry a higher mortality risk compared to the initial event.[7] The prevalence of recurrent strokes is anticipated to rise, particularly in developing nations, posing a significant public health

challenge.[8] Post-stroke complications such as reduced limb mobility, cognitive impairments, dementia, memory deficits, and mortality underscore the critical need for effective self-management strategies to prevent stroke recurrence.[8,9] Self-management efforts involve vigilant monitoring and control of risk factors like hypertension, diabetes, and dyslipidemia, along with lifestyle modifications encompassing healthy dietary choices, regular physical activity, and avoidance of harmful habits like smoking and excessive alcohol consumption.[10,11]

Effective self-management also entails adherence to healthcare professionals' recommendations and treatment regimens. However, not all stroke patients exhibit optimal self-management behaviors, rendering them vulnerable to recurrent strokes.[12] Various complex factors influence stroke patients' self-management capabilities, including their health status, stroke severity, physical and cognitive impairments post-stroke, social support networks, emotional well-being, knowledge about stroke, self-management skills, motivation levels, attitude towards health, confidence levels, access to resources and information, age, gender, personality traits, educational background, socioeconomic status, and availability of educational programs for patients and families.[13-15] While existing research has suggested that demographic factors like age may impact stroke patients' self-management practices, further exploration is warranted to comprehensively understand the determinants influencing patient engagement in post-stroke self-management and its implications for health outcomes.[15]

Furthermore, research indicates that understanding the disease and necessary self-management measures is crucial for optimizing post-stroke self-management. However, physical limitations and accessibility barriers may impede patients' ability to implement these measures, even with adequate knowledge.[16] Therefore, further investigation is warranted to explore the predominant factors influencing self-management and the prevention of recurrent strokes in post-stroke patients. Hence, the essential question that remains is: what factors influence self-management and the prevention of recurrent strokes in post-stroke patients?

Objectives

The primary objective is to identify the factors impacting the self-management practices of stroke survivors.

Methods

Study Design and Participants

In this cross-sectional study, the sample size was determined using Slovin's formula (n=N/(1+ Ne2), where N represents the population and e denotes the error margin (0.05). In April 2023, there were 153 post-stroke patients at a stroke foundation in Bali, Indonesia, from whom we obtained responses from 116 participants.[17] The inclusion criteria required participants to be aware of their stroke diagnosis, possess reading and writing abilities, and not have visual, verbal, or hearing impairments that would hinder questionnaire completion.

Data collection instruments

The data collection instruments included a demographic questionnaire and the Stroke Self-Management Questionnaire (SSMQ). Demographic information collected encompassed gender, age, occupation, number of strokes, and medical history. The SSMQ comprises 31 items related to daily activities aimed at reducing the risk of stroke recurrence and addressing specific and general risk factors.[14] These items cover three dimensions: stroke risk factors, consequences of stroke-related disability, and access to rehabilitation services within the healthcare system. Participants rated their agreement with each item on a 4-point Likert scale ranging from "1 = strongly disagree" to "4 = strongly agree," indicating their level of agreement with statements relevant to their current situation. The total score ranges from 31 to 124, with scores between 31 and 93 indicating poor self-management and scores between 94 and 124 indicating good self-management. The SSMQ demonstrated good validity and internal consistency reliability (Cronbach's alpha of 0.91).[14]

Procedures

The clinic manager at the stroke foundation clinic provided a detailed explanation of the research to all stroke patients. Subsequently, clinic staff distributed questionnaires to patients in the presence of a family member. Participants were instructed to complete the questionnaire after signing an informed consent form. Completed questionnaires were deposited in a secure container located at the reception desk, accessible only to designated personnel overseeing the research.

Data analysis

The data analysis was done using SPSS 24 software (IBM Corp., Armonk, NY, USA). Subsequently, both univariate and multiple logistic regression analysis were conducted. Univariate analysis aimed to assess the effect of each respondents' characteristics, including age, gender, education, occupation, frequency of stroke attacks, medical history, and self-management status. Data were presented as frequencies and percentages. Multiple logistic regression analysis aimed to identify factors influencing self-management using binomial logistic regression, with

a significance level set at < 0.05.

Ethical Considerations

Throughout this study, we adhered to ethical standards outlined in the Declaration of Helsinki. Ethical clearance was obtained from the Wira Medika Bali Ethic Commission (Number 117/E1.STIKES WIKA/EC/IV/2023) on April 23, 2023. Prior to participation, all individuals provided written informed consent.

Results

Among the subjects, 64.7% were male, and 69.8% were in the middle age category. The majority of participants were employed (71.6%) and had completed secondary school education (68.1%). Over half of the participants had experienced their first stroke (53.4%), and a majority had a history of hypertension (62.1%). Most participants demonstrated good self-management (81.9%), while 18.1% exhibited poor self-management [Table 1].

Table 1. Frequency distribution of the participants' characteristics

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

Self-management showed no significant correlation with gender or age. However, employment status, level of education, history of previous stroke, and pre-existing medical conditions were significantly associated with self-management [Table 2]. Regression analysis revealed that education (P=0.002, OR=2.136), previous stroke (P<0.001, OR=4.122), and pre-existing medical conditions (P=0.011, OR=7.151) were significantly associated with self-management [Table 3].

Table 2. Distribution of good and poor self-management based on the participants' characteristics

Variables	Self-management		P value [a]
	Good, n (%)	Poor, n (%)	
Gender			0.834
Male	61 (82.4)	14 (17.6)	
Female	34 (82.9)	7 (17.1)	
Age			0.862
Middle-aged	66 (81.5)	15 (18.5)	
Elderly	29 (82.9)	6 (17.1)	
Job			0.021
Unemployed	25 (83.3)	5 (16.7)	
Employed	70 (67.9)	13 (32.1)	
Education			0.008
No school /elementary school	53 (91.4)	5 (8.6)	
High school	42 (72.4)	16 (27.6)	
Stroke attack			0.000
First time	58 (93.5)	4 (6.5)	
>1 times	37 (67.3)	17 (32.7)	
Medical history			0.014
No history	41 (93.2)	3 (6.8)	
Having a comorbidity	54 (75)	18 (25)	

[a] Chi-square test or Fisher's exact test

Discussion

The study indicated that self-management among stroke survivors was influenced by factors such as education, pre-existing medical conditions, and history of previous strokes. Notably, pre-existing medical conditions emerged as the most influential factor affecting self-management. Conditions like hypertension, diabetes mellitus, and high cholesterol levels can have long-term repercussions for stroke patients. Hypertension, being the most prevalent pre-existing medical issue among our participants, can inflict damage on blood vessels, including those in the brain, thereby escalating the risk of stroke.[18] Proper self-management practices, such as adopting a healthy lifestyle, managing stress, and adhering to prescribed medications, are essential in controlling hypertension and mitigating the risk of recurrent strokes.[19] Hence, it is imperative to educate stroke survivors with pre-existing medical conditions, like hypertension, on stringent and consistent risk factor management.[18]

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

Variable	Coefficient	P-value	OR	95% CI
Step 1				
Job	1,886	0.202	2,412	0.106-6.329
Education	1,579	0.026	2,206	1.051-7.221
Previous stroke	2,056	0.002	4,128	1035-7,899
Pre-existing medical problems	2.014	0.007	6,133	1.031-9.676
Constant	-2,756	<0.001	0.004	
Step 2				
Education	1,993	0.002	2.136	1.039-8.334
Previous Stroke	2.107	<0.001	4.122	1.034-10.776
Pre-existing medical problems	2,890	0.011	7.151	1.035-9.707
Constant	-2,571	<0.001	0.002	

Moreover, our study found that stroke survivors experiencing their first stroke demonstrated good self-management, while those with recurrent strokes exhibited poorer self-management. Recurrent strokes heighten the likelihood of sequelae and severe physical complications, including muscle weakness, balance and sensory impairments, and speech difficulties. These physical limitations can impede an individual's ability to effectively self-manage.[20] Additionally, good post-stroke self-management is often associated with the absence of comorbidities, whereas individuals with comorbid conditions tend to exhibit poorer self-management.[21]

The study revealed that stroke survivors with lower education levels demonstrated good self-management, whereas those with higher levels of education were more likely to exhibit poor self-management. Education is typically associated with a better understanding of the situation and increased awareness of the importance of self-care, making it a positive factor for self-management.[22] However, in our study, stroke survivors with higher education levels showed poorer self-management. Individuals with higher education levels may experience frustration or difficulty in accepting changes, which can negatively impact their ability to self-manage.[23] Klockar et al. also noted that stroke survivors with higher education levels were less prepared to accept behavioral changes due to their higher expectations of themselves. Consequently, they may be more prone to depression and anxiety after experiencing a stroke, which can then hinder their motivation and ability to effectively self-manage.[24]

Furthermore, our study found that good self-management was associated with unemployment. Employed individuals often have increased responsibilities, both financially for their families and in the demands of their workplace, which can lead to higher stress levels and less time for self-care. High-stress jobs can also contribute to elevated blood pressure, increasing the risk of stroke.[25]

Several limitations should be considered in interpreting the findings of this study. Firstly, the research was conducted in a single healthcare facility, potentially limiting the generalizability of the results to other settings. Additionally, the cross-sectional design of the study restricts the ability to establish causality between the variables studied. Lastly, the accuracy of patient responses may have been influenced by physical or cognitive limitations.

Conclusions

Recurrent stroke attacks pose a significant concern for stroke survivors, their families, and healthcare providers, particularly nurses. This study identified education, previous stroke experience, and comorbid disorders as significant factors influencing self-management and the occurrence of recurrent attacks. Understanding and considering these factors are crucial for designing appropriate interventions and support to enhance stroke patients' self-management. Personalized approaches and tailored self-management strategies based on medical history, education level, and stroke experience may improve the effectiveness of recurrent attack risk prevention and management in post-stroke patients.

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Competing interests

The authors declare that they have no competing interests.

Abbreviations

Stroke Self-Management Questionnaire: SSMQ;

Authors' contributions

Study design: NLPTD, IMK, IGJ.

Data collection: AAIDHY, NMNW, NMDPP.

Data analysis: NLPTD, AAIDHY, NMDPP.

Study supervision: IMK.

Manuscript writing: IGJ.

Critical revisions for important intellectual content: NLPTD, IMK, IGJ, AAIDHY, NMNW, NMDPP.

All authors read and approved the final manuscript. All authors take responsibility for the integrity of the data and the accuracy of the data analysis.

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Role of the funding source

None.

Availability of data and materials

The data used in this study are available from the corresponding author on request.

Ethics approval and consent to participate

Throughout the entirety of this inquiry, we maintained our dedication to upholding the ethical standards outlined in the Declaration of Helsinki. Ethical clearance reviewed and approved by the STIKes Wira Medika Ethic Review Board (117/E1.STIKESWIKA/EC/IV/2023). Before enrolling in the research study, each participant provided their written informed consent. Participants was freely to denied or withdraw from this research during data collection

Consent for publication

By submitting this document, the authors declare their consent for the final accepted version of the manuscript to be considered for publication.

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