

## Research Article

# Factors Influencing Adherence to the Treatment in Stroke Patients

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**ORCID**Anis Ika Nur Rohmah: <https://orcid.org/0000-0001-8535-1851>**Abstract.**

Adherence in stroke patients for routine re-control is at 50% of total stroke patients. Non-adherence can increase the incidence of recurrent strokes. In stroke recurrence, disability and mortality will increase. This study aimed to determine the factors influencing treatment adherence in stroke patients based on literature studies. This study used a literature study with a sample of 14 journals: Pubmed (n=7), Proquest (n=4), SAGE Journal (n=1), and Science Direct (n=2). The literature study began with identifying data search problems, screening, and quality assessment using JBI cross-sectional studies, cohort studies, qualitative studies, dan Randomized Control trials and analyzed using thematic analysis techniques. As many as 35% of the factors that influence adherence to treatment in stroke patients are beliefs about treatment factors, and social factors and knowledge influence 15% of factors. Economic factors have an estimated percentage of 11% for physical characteristics, and marital status has a rate of 8%; also, age and gender factors have the same presentation, namely 4%. The factor that most influences medication adherence in stroke patients is the belief in the treatment.

**Keywords:** factors, influence, treatment adherence, stroke patients

## 1. INTRODUCTION

According to WHO, stroke is a rapidly developing clinical sign of focal or global disturbance of brain function, with symptoms lasting 24 hours or more or leading to death, with no apparent cause other than vascular. Stroke results in the death of some brain cells due to a lack of oxygen in the blood flow or arteries to the brain. When blood flow to the brain is lost due to problems or ruptures of routes to the brain, it can also lead to dementia and depression. Stroke is the second leading cause of death worldwide and the third most common cause of disability worldwide. Globally, 70% of strokes and 87% of stroke-related deaths occur in low- and middle-income countries (1). According to the 2016 Global Burden of Disease calculation, the Lifetime Risk of Stroke increased from 22.8% in 1990 to 24.9%. Riskesdas data in 2018, the prevalence of stroke in Indonesia increased to 10.9 per mil from the previous data of 7 per mil. The increase was most

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significant in urban areas with more male sufferers. Meanwhile, the compliance of stroke patients to carry out routine re-control still amounts to 50% of the total stroke patients, and the other 50% still needs to be routinely re-checked (2).

Medication adherence is an essential part of managing patients with chronic diseases. According to the World Health Organization (WHO), medication adherence is the extent to which a person's behaviour in taking medication, following a diet, and implementing lifestyle changes, is following recommendations from health care providers. This definition highlights the importance of active involvement of patients and health workers with good communication (3). Non-compliance will not only impact the individual concerned but will also broadly affect the state budget through BPJS (5). The use of secondary prevention strategies has been reported to reduce the risk of stroke recurrence by 80%, vascular events or death (6). Failure to do re-control indicates the patient's non-compliance in taking treatment because patients who do not re-control will not get medication, which can increase the possibility of recurrence in stroke patients. After seeing the description of the phenomena, problems, and data above, researchers are interested in conducting research related to the literature study of factors that affect medication adherence in stroke patients.

## 2. MATERIALS AND METHODS

This study uses a literature study which is a way to obtain data or information through reviewing reference books and previous studies related to the problems discussed (7). In this study, researchers examine the problem through international journals sourced from research reports. This research uses a design based on Flow Charts to analyze the factors influencing medication adherence. In stroke patients, based on literature studies. In this research, problem identification is carried out by examining problems in international journals and examining statistical data in Indonesia so that the focus of the problem in this study is obtained, namely, the factors that can affect medication adherence in stroke patients. Journal search websites used by researchers in conducting data searches are journal websites that can be accessed freely, such as Science Direct, Pubmed, Google Scholar, and Proquest. Based on the research journal "factors that affect medication adherence in stroke patients, ". So the researchers used the search keywords for factors, influence, medical adherence, and stroke patient. The researcher determines the inclusion criteria of the journals that will be accessed as a basis for the research process on the topic, including the journal published in the last 5 years (2016-2020), the research method used is RCT, Cross-Sectional, and Cohort

studies, the journal can be accessed in full text, International Journal, Journal theme about medication adherence in stroke patients. At the screening stage, researchers conducted two screenings, the first screening focused on journal abstracts. Meanwhile, in the second screening, the researchers specified whether the journals obtained were by the topic. Researchers use JBI (Joanna Briggs Institute) Critical Appraisal Tool. From the results of the assessment of the quality of the next study, researchers collect and explore available information from each main study based on the screening results. Then the journals were analyzed using Thematic Analysis, being reviewed one by one so that conclusions obtained for the theme or topic of factors that affect medication adherence in stroke patients.

### 3. RESULTS

Analysis of data from research conducted using the literature study method, which collects data from four international journal database websites, including ScienceDirect, ProQuest, Pubmed and SAGE Journals. In this study, researchers obtained 33,972 journals, including 13,592 Sciencedirect journals, 16,272 ProQuest, 136 Pubmed journals, and 3,971 SAGE Journals. Journals collected at the time of the search were carried out by JBI analysis first to assess the quality of the study and obtain literature that was by the formulation of the problem raised by the researcher in the literature study research. The search results for screening journals with journal criteria starting from 2016-2020, international journals, full text and research articles type journals. After going through a series of screening processes and assessing the quality of the study, 14 journals were obtained, which were then analyzed, Pubmed (n=7), Proquest (n=4), SAGE Journal (n=1), Sciencedirect (n=2), it can be concluded that the Pubmed website portal is a portal that is obtained by many journals by researchers. From the analysis of 14 journals with adjustment of inclusion criteria included in this study, researchers used demographic data in the form of marital status and gender with the following data:

#### 3.1. Marital status

Demographic data on marital status is an indicator analyzed by researchers to support researchers in answering research objectives. The marital status of the sample in the journal obtained married, unmarried and divorced groups, and the proportion of samples with marital status obtained a percentage of 52%. The unmarried or single group has a percentage of 20%, while in the divorced group the total percentage is 28%. Therefore, it

can be concluded that most of the samples have married status with the most significant percentage compared to other groups, which is 52%. In assessing the percentage, the researcher calculated the number of samples from all journals with married or marital status indicators.

### 3.2. Gender

Demographic data based on the grouping of stroke patients, in terms of the results of the analysis of 14 journals where depicted in Figure ??2. The results obtained from all subjects with stroke by 61% occurred in the male sample with a total (n = 22297) and 39% occurred in women with a sample size of (n=14072). It can be concluded that the proportion of strokes in men is more than in women.

### 3.3. Overview of Factors Affecting Treatment Adherence in Stroke Patients in the Journal

The results showed that several studies reported that several indicators influence the adherence to treatment of stroke patients. The six indicators include factors of belief in treatment, knowledge, physical, social, economic, gender, marital status and age. The most influencing factor of the 14 journals is the belief in the treatment possessed by the patient, followed by social factors.

## 4. DISCUSSION

There were 14 journals in this study, and most of the research methods in journals used cross-sectional studies. A discussion of the results of the literature study on what factors affect medication adherence in stroke patients, as follows

### 4.1. Marital status

Marital status impacts medication adherence because the family is the smallest social unit closely related to patients. Therefore, marital status is one-factor affecting patient medication adherence. Research conducted by Abanto confirmed that married patients had more than three and a half times higher good adherence to performance measures compared to those who were single(8). This happens because married patients receive treatment from their partners. In developing countries, staff is often insufficient to provide

every patient's health services. Therefore, it is not uncommon for family members, especially spouses, to frequently purchase medicines outside the hospital and help feed patients. In addition, most of the older patients have husbands or wives who are no longer working and can participate as nurses in the hospital. research also confirms that there is an impact of clinical and demographic characteristics believed to influence adherence in the study population, including current marital status (9).

## 4.2. Gender

Gender characteristics are also related to the nature of exposure and susceptibility to a particular disease. For example, in the case of stroke, men are more at risk of having a stroke than women. This is because men are more likely to engage in behaviours that are risky to health, such as smoking, consuming alcohol and others. In addition, at childbearing age, hormonal factors and menstrual cycles in women cause women's blood circulation and heart to be healthier than men's (10). Since birth, women have had a more vigorous resistance than men, both in terms of resistance to pain or disease. Men have the hormone testosterone, which can increase LDL levels in the blood; if LDL levels are high, there will be an increase in blood cholesterol levels; if cholesterol levels in the blood are high, the risk of degenerative diseases will also be high (11). According to a study conducted by Cheiloudaki & Alexopoulos, more male patients had poor adherence and an increase related to lower adherence. Men have low compliance because women are more often in caring roles than men. Most male patients often depend on their wives' help or female relatives' support (12).

## 4.3. Belief in Treatment

Health Belief Model (HBM) is a model that describes medication adherence behaviour in patients. Patients' beliefs about the seriousness and infectivity of their disease are important factors for treatment adherence. Patients' attitudes about the seriousness of the perceived risk and their belief in the susceptibility of the drugs consumed play an essential role in adherence behaviour (13). A study by Ruksakulpiwat stated that treatment beliefs directly consequence the patient's intentions and decisions regarding drug intake, resulting in consistent consumption behaviour (14). Education beliefs influence medication adherence and are mediated by factors such as patient concerns about the medication and beliefs that doctors overuse medications. Reinforced by the results of research by Appalاسamy, which states that beliefs about medication are

strongly related to medication adherence, the percentage of beliefs about medication (74.02%) is the most common reason for medication non-adherence (15). This is further strengthened by research conducted by Jamison, which states that perceptual beliefs affect adherence, namely how patients consciously make decisions that affect their drug-taking behaviour. This occurs when the patient deliberately chooses not to follow the advice and beliefs about treatment affecting motivation to initiate and continue treatment (4). So the researchers concluded that the belief factor in the treatment of stroke patients was able to affect the adherence to treatment of stroke patients.

#### 4.4. Knowledge

Knowledge is very important to stimulate the formation of one's behavior. Behavior that is based on knowledge and a positive attitude will last for a long time. Lack of knowledge is related to a lack of understanding about therapy and concerns about the lack of information provided by health workers. The lack of knowledge identified among stroke survivors and nurses indicates the need for increased education about stroke and the treatment of the condition (10). Patient compliance related to the use and storage of drugs, increased along with previous knowledge about drugs and how to administer them. While patient non-adherence to treatment, almost three-quarters of all participants lack knowledge about treatment, so it is significantly associated with intentional non-adherence (4). Reinforced by research conducted by Appalasamy, Stating that the majority of patients who have been exposed to stroke education or are familiar with stroke knowledge and prevention management have high adherence (78.4%) (15).

#### 4.5. Social

Social support is an individual's belief in the availability of support that comes from family, friends and closest people in social support interpersonal exchange occurs where an individual provides assistance to other individuals. Good social support and quality family assistance can improve medication adherence in stroke patients. the higher the social support received by the patient, the higher the patient's adherence to treatment. The patient's family, especially the patient's nurse, must be able to find ways to activate the source of support and direct it, both sources of support that come from the family and other than from the family (16). Stroke has an impact on the presence of dysfunction so that it can cause psychological and social effects on patients,

such as the emergence of feelings of inferiority, feelings of disadvantage, feelings of wanting to regain decreased abilities, feelings of grief, anxiety and hopelessness, where these are signs and symptoms low self-efficacy. Low self-efficacy can cause anxiety, impacting the patient's healing process, such as the treatment process for patients (17). The results of the research conducted by stated that the existence of family and social participation as measured by the SSQOL instrument showed a significant correlation between family support and medication adherence in stroke patients. 25% of compliant patients are influenced by various factors, one of which is family and social participation (12).. The findings by Rohde, highlight that the role of family members in assisting stroke survivors with medication administration, is a legitimate and cost-effective strategy to improve medication adherence in stroke survivors. This can be seen from the extent to which family members help take medication, because most stroke survivors receive assistance, especially if there is cognitive impairment. Therefore, involving stroke survivors and family members or can improve medication adherence in stroke patients (18).

#### 4.6. Physical

Physical factors are indicators that can affect medication adherence in stroke patients. The physical factors discussed in this section are post-stroke disability or post-stroke disability. Disability after stroke can trigger other mental and functional factors, requiring social support from the closest people in carrying out post-stroke treatment. Patients with more severe disability due to stroke, have the potential to improve adherence and ultimately improve health outcomes. Therefore , the researcher concludes that physical factors such as disability or disability make stroke patients have the potential to increase compliance due to assistance from the family (4).

#### 4.7. Economy

Factors that affect medication adherence consist of internal factors and external factors. Internal factors include the level of knowledge, belief in treatment, physical, and young age. Meanwhile, external factors include social and economic support. Patients with sufficient household income to meet their needs were more likely to have low adherence, whereas patients with less severe strokes and higher self-reported family income tended to have persistence—higher treatment adherence (19). Economic factors are also corroborated by research conducted by Eriksson, which states that adherence

to medication decreases along with a decrease in income, and medication adherence is also worse among patients with low socioeconomic status (20). Meanwhile, according to research by Jamison, the obstacles in carrying out treatment adherence are difficulties in meeting treatment costs and the high burden of drug costs (4).

#### 4.8. Age

According to Kementerian Kesehatan RI Badan Penelitian dan Pengembangan, the prevalence of stroke in Indonesia increases with increasing age with the highest cases at >75 years old (43.1%) (2). In the elderly, there is a general weakness of body functions including flexibility of blood vessels, with the older a person's age, the hope for healing also decreases. According to a study conducted by Jiang et al, stated that Compared to patients with low adherence, patients with high adherence tended to be younger (median age 64 vs median age 65;  $p < 0.001$ ) (21).

### 5. CONCLUSION

Factors affecting medication adherence in stroke patients include belief in treatment, knowledge, social, physical, economic and age. The most influential factor on the quality of life of stroke patients is the belief in treatment, perception beliefs affect adherence, namely how patients consciously make decisions that affect their drug-taking behavior. This occurs when the patient deliberately chooses not to follow the advice and beliefs about treatment affecting motivation to initiate and continue treatment.

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### References

- [1] Johnson W, Onuma O, Owolabi M, Sachdev S. Stroke: a global response is needed. *Bull World Health Organ.* 2016 Sep;94(9):634–634A.
- [2] Riskesdas. Hasil Utama Riset Kesehatan Dasar. Kementerian Kesehatan Republik Indonesia [Internet]. 2018;1–100. Available from: <http://www.depkes.go.id/resources/download/info-terkini/hasil-riskesdas-2018.pdf>
- [3] Zelko E, Klemenc-Ketis Z, Tusek-Bunc K, Klemenc-Ketis Z, Tusek-Bunc K. Medication Adherence in Elderly with Polypharmacy Living at Home: a Systematic Review of Existing Studies. *Mater Sociomed.* 2016 Apr;28(2):129–32.

- [4] Jamison J, Sutton S, Mant J, De Simoni A. Barriers and facilitators to adherence to secondary stroke prevention medications after stroke: analysis of survivors and caregivers views from an online stroke forum. *BMJ Open*. 2017 Jul;7(7):16814.
- [5] Choliso H, Karuniawati H, Azizah T, Zaenab, Hekmah LN. Faktor-Faktor yang Mempengaruhi Ketidakpatuhan Dalam Melakukan Terapi Pencegahan Sekunder pada Pasien Stroke Iskemik. *Jmpf* [Internet]. 2018;8(2):90–9. Available from: <https://www.scribd.com/document/486391224/4>
- [6] Al AlShaikh S, Quinn T, Dunn W, Walters M, Dawson J. Predictive factors of non-adherence to secondary preventative medication after stroke or transient ischaemic attack: A systematic review and meta-analyses. *Eur Stroke J*. 2016 Jun;1(2):65–75.
- [7] Ramandha A, Kusmindari CD, Hardini S. Pelaksanaan Total Productive Maintenance Terhadap Kinerja Bucket Wheel Excavator Melalui Cause Effect Diagram (Studi Kasus pada PT Bukit Asam, Tbk). *Bina Darma Conf Eng Sci*; 2020. pp. 340–54.
- [8] Murphy SJ, Coughlan CA, Tobin O, Kinsella J, Lonergan R, Gutkin M, et al. Continuation and adherence rates on initially-prescribed intensive secondary prevention therapy after Rapid Access Stroke Prevention (RASP) service assessment [Internet]. *J Neurol Sci*. 2016 Feb;361:13–8
- [9] Jamison J, Gaffy J, Mullis R, Mant J, Sutton S. Barriers to medication adherence for the secondary prevention of stroke: a qualitative interview study in primary care. *The British Journal of General Practice*. 2016;(August):568–76. <https://doi.org/10.3399/bjgp16X685609>.
- [10] Characteristic RB, Laily SR, Timur J. Relationship Between Characteristic and Hypertension With Incidence of Ischemic Stroke. 2017 Apr;2016:48–59.
- [11] Cheiloudaki E, Alexopoulos EC. Adherence to Treatment in Stroke Patients. *Int J Environ Res Public Health*. 2019; <https://doi.org/10.3390/ijerph16020196>.
- [12] Azizi N, Karimy M, Salahshour VN. Original Article Determinants of adherence to tuberculosis treatment in Iranian patients : Application of health belief model. *J Infect Dev Ctries*. 2018 Sep 30;12(9):706-711. doi: 10.3855/jidc.9653.
- [13] Yue S. The Association Among Medication Beliefs, Perception of Illness and Medication Adherence in Ischemic Stroke Patients : A Cross-Sectional Study in China. *Patient Prefer Adherence*. 2020;235–47.
- [14] Appalasaamy JR, Joseph JP. Exploring stroke survivors self-efficacy in understanding and taking medication and determining associated factors: a cross-sectional study in a neurology clinic in Malaysia. *Patient Prefer Adherence*. . 2019 Aug 28;13:1463-1475. doi: 10.2147/PPA.S215271. eCollection 2019.
- [15] Juniastira S. Hidup Pada Pasien Stroke. 2018

- [16] Wahyuni S, Dewi C. Faktor-Faktor Yang Berhubungan Dengan Efikasi Diri Pasien Pasca Stroke: Studi Cross Sectional Di Rsud Gambiran Kediri Factors Associated With Self-Efficacy Of Post-Stroke Patients: A Cross-Sectional Study In Gambiran Kediri. 2018;85–92.
- [17] Rohde D, Merriman NA, Doyle F, Bennett K, Williams D, Hickey A. Does cognitive impairment impact adherence? A systematic review and meta-analysis of the association between cognitive impairment and medication non-adherence in stroke. *PLoS One*. 2017 Dec;12(12):189339.
- [18] Jiang Y, Yang X, Li Z, Pan Y, Wang Y, Wang Y, et al. Persistence of secondary prevention medication and related factors for acute ischemic stroke and transient ischemic attack in China [Internet]. *Neurol Res*. 2017 Jun;39(6):492–7.
- [19] Eriksson M, Glader E, Sjo M. Inequalities in medication adherence to statin treatment after stroke: A nationwide observational study. *Eur Stroke J*. 2016 Jun;1(2):101-107. doi: 10.1177/2396987316646026. Epub 2016 Apr 21.
- [20] Jiang F, Deng L, Zhang L, Cai Y, Cheung CW, Xia Z. Review of the Clinical Characteristics of Coronavirus Disease 2019 (COVID-19). *J Gen Intern Med* 2020 May;35(5):1545-1549. doi: 10.1007/s11606-020-05762-w. Epub 2020 Mar 4.