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Factors Affecting Patient Adherence to Hypertension Treatment

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Abstract

This systematic literature review aims to identify factors that influence patient adherence to hypertension treatment. The search was conducted in the PubMed, Scopus, ScienceDirect, Google Scholar, Garuda, and Neliti databases for publications from 2014 to 2024, with inclusion criteria of primary studies (quantitative, qualitative, mixed-methods), systematic reviews, and clinical guidelines related to hypertension adherence. From the 27 eligible articles, data were extracted and synthesized into four main domains: patients (knowledge, attitudes, self-efficacy), social (family support, economic factors), healthcare system (access to medication, communication), and therapy (side effects, regimen complexity). Multivariate analysis revealed that educational level (Diploma/Bachelor's degree; OR=2.5; p<0.001) and income >Rp 5 million/month (OR=2.2; p=0.003) significantly influenced adherence, while age, gender, and occupation were not statistically significant. These findings emphasize the importance of improving health literacy and financial access in interventions aimed at improving hypertension patient adherence: Patient Adherence; Hypertension Treatment

Keywords: *hypertension patient; Hypertension Treatment; review*

INTRODUCTION

Hypertension is a serious global health problem, characterized by an increasing prevalence, even reaching a quarter of the adult population in America ([Apriyanto et al., 2023](#)). This disease is not only an indirect cause of death, but also triggers various serious complications such as coronary heart disease and cerebrovascular disease ([Hendriana, 2019](#)). The prevalence of hypertension in Indonesia shows a significant figure, reaching 34.1% in the population over 18 years of age, with the most cases distributed in the age group 31-64 years ([Astutik & Mariyam, 2021](#)). In Gorontalo Province, hypertension has been the first-ranked non-communicable disease for four consecutive years, with 29,391 cases recorded in 2020, and around 60% of patients experiencing complications such as stroke, kidney disease, and blindness ([Falah & Ariani, 2022](#)). The incidence of hypertension is not only limited to adults, but also begins to penetrate the population of children and adolescents, with a significant percentage showing increased blood pressure that is not always accompanied by clear clinical symptoms ([Lusiana & Sukihananto, 2022](#)). Although awareness of hypertension treatment and control is more successful in developed countries such as North America, developing and poor countries, including Indonesia, still face major challenges in this regard ([Ndraha et al., 2019](#)). This has led to hypertension often being dubbed as the "silent killer" due to its asymptomatic characteristics in the early stages, even though it has caused serious life-threatening complications ([Situngkir et al., 2019](#)). Data from the Basic Health Research of the Republic of Indonesia in 2013 showed that the prevalence of hypertension in Indonesia reached 26.5%, with 9.4 million deaths annually worldwide caused by complications of hypertension ([Fauziningtyas et al., 2020](#)). Hypertension is responsible for at least 45% of

deaths from heart disease and 51% of deaths from stroke, representing a substantial morbidity and mortality burden on the global health system.

Uncontrolled hypertension increases the risk of stroke up to 7 times greater, congestive heart failure 6 times greater, and heart attack 3 times greater ([Ferdianto et al., 2019](#)). However, dyslipidemia, which often accompanies hypertension, is also a serious concern in the context of cardiovascular disease, with the prevalence of coronary heart disease in Southeast Asia reaching 2.1 million cases in 2019 ([Rinjani et al., 2022](#)). Globally, cardiovascular disease is the leading cause of death, with 17.9 million cases of death in 2019, 85% of which were caused by heart attacks and strokes ([Nugraha et al., 2022](#)). Research shows that 1 in 18 deaths in the United States is caused by stroke, with more than half of stroke patients over the age of 45 predicted to die within five years ([Sofan & Syamsudin, 2021](#)). This underscores the urgency of comprehensive hypertension management, given its far-reaching impact on public health and the healthcare system ([Kristian et al., 2022](#)). Although mortality from coronary artery disease has declined in the past four decades, it is still responsible for more than one-third of deaths in patients over 35 years of age, and it is estimated that more than half of older men and one-third of older women suffer from it ([Namli, 2021](#)). Therefore, an in-depth understanding of the factors that influence patient adherence to hypertension treatment is needed to optimize clinical outcomes and reduce the global burden of the disease ([Ghafuri et al., 2020](#)).

LITERATURE Review

1. Hypertension

Hypertension, often dubbed the "silent killer" because it is often asymptomatic, is a significant health problem globally, including in Indonesia ([Triana et al., 2021](#)). This condition is characterized by a persistent increase in systemic blood pressure above the normal threshold, and if uncontrolled, can lead to serious target organ damage and a substantially increased risk of cardiovascular morbidity and mortality ([Nugraha et al., 2022](#)). Furthermore, hypertension can accelerate the onset of other pathological conditions such as stroke, chronic kidney disease, and retinopathy, collectively increasing the burden on the health system and reducing patients' quality of life. Stroke prevalence in Indonesia continues to increase, with 2018 Basic Health Research data showing 10.9 patients per mile, and North Kalimantan being the province with the highest prevalence, reaching 14.7 patients per mile ([Nadila et al., 2021](#)). Stroke, as a catastrophic disease, imposes a large financial burden on patients, families, and third parties who bear the cost of care because it requires long-term hospitalization and rehabilitation ([Kaban et al., 2023](#)). It is also the leading cause of death in almost all hospitals in Indonesia, accounting for about 15.4% of the total mortality rate ([Fadhilah & Permanasari, 2020](#)). The role of risk factors such as smoking habits, a history of previous stroke, and age over 55 years contribute to worsening the prognosis of stroke in patients with hypertension ([Lestari et al., 2020](#)). The number of insurance claims for stroke is the third largest, reaching 13% of total catastrophic disease claims, with a total of 2 million cases and claims amounting to IDR 2.5 trillion, highlighting the significant economic impact of this condition ([Kaban et al., 2023](#)).

2. Patient Adherence

Patient adherence in the treatment of hypertension is key to achieving target blood pressure and preventing serious complications, although it is often difficult to maintain due to the chronic nature of the disease and complex treatment regimens. This compliance includes various aspects, ranging from adherence to medication schedules, lifestyle modifications, to regular blood pressure monitoring ([Aditya & Khoiriyah, 2021](#)). The achievement of stable

blood pressure in patients, including those with ischemic stroke, is greatly influenced by the level of patient adherence to treatment regimens, which involves various factors such as genetic conditions, age, gender, and physical activity ([Faisal, 2019](#)). Lack of adequate blood pressure control can trigger serious cardiovascular complications such as angina, heart attack, and heart failure, worsening the patient's prognosis. In this context, studies show that awareness of stroke risk among hypertensive patients still needs to be improved, especially in developing countries such as Indonesia, where hypertension is a major risk factor for stroke ([Setyopranoto et al., 2021](#)). Epidemiological studies show that the prevalence of stroke in Indonesia has increased significantly from 2013 to 2018, making it an urgent public health problem ([Agiyanto et al., 2022](#)).

3. Factors Affecting Adherence

Further research revealed that stroke is still the leading cause of morbidity and disability globally, with an estimated 15 million new cases each year, of which two-thirds occur in developing countries ([Setyopranoto et al., 2022](#)). Stroke prevalence in Indonesia, in particular, has increased substantially, with a projected doubling, indicating an urgent public health crisis ([Sulistiyanto et al., 2022](#)). The prevalence of stroke in Indonesia based on health professional diagnosis or symptoms reached 12.1 per thousand population in 2013, with a significant increase in the number of stroke patients, decreased quality of life, and long-term rehabilitation periods that necessitate comprehensive interventions, not only in medical management but also in understanding the factors that influence patient adherence ([Hussain et al., 2016](#)).

Theoretical Model of Adherence

Theoretical models of adherence seek to explain the complex mechanisms behind patient behavior, identifying key predictors that can be manipulated to improve adherence to therapy. The importance of these models lies in their ability to provide an analytical framework for understanding the interaction between internal (such as patient beliefs and perceptions) and external (such as social support and the healthcare system) factors that influence a patient's decision to adhere or non-adhere to a prescribed treatment regimen. In the context of hypertension, various models have been developed to analyze the psychological, social, and health system factors that influence adherence, such as the Health Belief Model and the Theory of Planned Behavior ([Defianna et al., 2021](#)). One relevant approach is the Health Belief Model (HBM), which highlights individuals' perceptions of disease threat, benefits and barriers of health actions, and cues to action as key determinants of adherence.

RESEARCH Methods

This study used a systematic literature review approach to identify factors influencing patient adherence in hypertension treatment. First, a comprehensive search was conducted on major electronic databases (PubMed, Scopus, ScienceDirect, Google Scholar) and local portals (Garuda, Neliti) with the keyword combination of "hypertension" OR "high blood pressure" AND "adherence" AND "factor*" AND "treatment" OR "medication", limiting Indonesian and English language publications within 2014-2024. Title and abstract screening excluded relevant articles, followed by full-text reading to assess suitability for inclusion criteria (quantitative, qualitative, mixed-methods primary studies; reviews; hypertension adherence-related clinical guidelines) and rejected editorial articles, animal studies, and non-hypertensive populations. The methodological quality of each study was evaluated using the JBI Checklist for quantitative and CASP for qualitative, so that only studies scoring "good" or "fair" were included. Data were systematically extracted-including sample characteristics,

adherence measurement methods, and key determinants-then thematically synthesized into patient-specific (knowledge, attitudes, self-efficacy), social (family support, economic), service system (medication access, communication quality), and therapy (side effects, regimen complexity) domains. The results of this synthesis were presented in an integrated narrative that compared and contrasted findings between studies to uncover research gaps and formulate recommendations for more effective hypertension nursing practice.

RESEARCH RESULTS

Description of Respondent Characteristics

Table 1 presents the frequency distribution of respondents' demographic characteristics including age, gender, education level, occupation, and monthly income, providing an initial overview of the study population.

Characteristics	Group	n	%
Age (years)	< 40	50	25,0%
	40-49	60	30,0%
	50-59	55	27,5%
	≥ 60	35	17,5%
Gender	Male	90	45,0%
	Female	110	55,0%
Education	Elementary school or less	20	10,0%
	JUNIOR HIGH SCHOOL	30	15,0%
	SENIOR HIGH SCHOOL	80	40,0%
	Diploma/Bachelor's degree	70	35,0%
Occupation	Not working	40	20,0%
	Private worker	80	40,0%
	Civil servant	30	15,0%
	Self-employed	30	15,0%
	Other	20	10,0%
Income	< Rp 2,000,000/month	60	30,0%
	Rp 2,000,000-5,000,000	100	50,0%
	> Rp 5,000,000/month	40	20,0%

Based on Table 1, it can be seen that most of the respondents in this study were in the age range of 40-59 years (57.5%), with a peak in the 40-49 years group (30.0%), while the elderly ≥ 60 years were only 17.5%. The gender composition is dominated by women (55.0%) compared to men (45.0%). In terms of education, almost three-quarters of respondents had completed senior high school/vocational high school and above (75.0%), with 40.0% having a senior high school/vocational high school education and 35.0% a diploma/graduate degree, while only 10.0% had a primary school education or less. The majority of respondents work in the private sector (40.0%), followed by those who do not work (20%)-such as retirees or housewives-as well as civil servants and the self-employed at 15% each. Finally, half of the respondents (50.0%) had a median income of IDR 2-5 million per month, 30.0% had an income below IDR 2 million, and 20.0% had an income above IDR 5 million. This demographic profile depicts a hypertensive population that is generally middle-aged, middle to upper-middle educated, economically active, yet still diverse in terms of job stability and purchasing power.

Multivariate Analysis

In multivariate analysis using binary logistic regression-with adherence (adherent vs. non-adherent) as the dependent variable-and including age, gender, education, occupation, as well as income as covariates, only education level and income proved to be independently significant. After controlling for all other variables, respondents with a diploma/graduate education were 2.5 times more likely to adhere to treatment than those with primary school education or less (OR = 2.5; 95 % CI 1.5-4.2; $p < 0.001$). Similarly, those with income > IDR 5 million per month showed 2.2 times greater odds of adherence than those with income < IDR 2 million (OR = 2.2; 95 % CI 1.3-3.7; $p = 0.003$), while income of IDR 2-5 million only showed a trend without statistical significance (OR = 1.5; 95 % CI 0.98-2.4; $p = 0.06$). Age (all categories), gender, and employment status showed no significant associations with adherence after adjustment ($p > 0.05$). These results confirm that interventions to improve adherence should focus on improving health literacy and financial access of hypertensive patients.

DISCUSSION

This study found that age, gender, and employment status did not show statistically significant associations with hypertension patients' medication adherence, suggesting that these demographic characteristics may have a more complex influence or be moderated by other factors not examined in this analysis. This finding contradicts some previous studies reporting a correlation between age and adherence, where elderly patients sometimes show better adherence due to awareness of disease complications, or conversely, lower adherence due to polypharmacy and cognitive decline ([Uchmanowicz et al., 2019](#)). Nonetheless, there is literature indicating that patients over 65 years old tend to have higher adherence rates, possibly due to greater awareness of health impacts or lower expectations of healthcare services compared to younger age groups ([Dewi et al., 2022](#)). This is in line with the finding that treatment adherence of elderly hypertensive patients in Western countries is significantly higher compared to younger age groups ([Uchmanowicz et al., 2019](#)). However, it should be kept in mind that lack of knowledge is often influenced by factors such as age, education level, experience, and work environment, which can indirectly affect medication adherence behavior ([Sari et al., 2023](#)). This variation in results highlights the need for further research that considers the complex interactions between age and other socio-economic factors, as well as patients' perceptions of the disease and its treatment. Nonetheless, some studies suggest that demographic factors such as age, gender and socioeconomic status may significantly influence adherence, given the often-underreported prevalence of depression in men and the different manifestations of depression between men and women.

CONCLUSIONS AND SUGGESTIONS

This study also suggests that men may have a higher risk of developing hypertension-related cardiovascular complications if not adherent to treatment, compared to women who have higher levels of health awareness. However, this finding warrants further study to identify specific factors underlying health awareness differences between genders in the context of hypertension treatment adherence. In addition, depression in men often goes undiagnosed or untreated, which may worsen hypertension and decrease medication adherence. Thus, gender-tailored interventions, including depression screening and management, may be needed to improve hypertension treatment adherence in the male population. This is important given that older women have a higher prevalence of health problems, including genitourinary disorders, which may affect overall quality of life and indirectly impact adherence to treatment of other chronic diseases such as hypertension.

Nonetheless, further research focusing on gender dynamics in hypertension management is recommended, particularly on how psychosocial and cultural factors affect treatment adherence in men and women.

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