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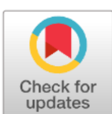
Original Research

# Association Between Medication Adherence and Body Mass Index Among Elderly Patients with Hypertension: A Cross-Sectional Study



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## Abstract

**Background:** Hypertension remains a major global health problem, with a high prevalence and low treatment adherence. The World Health Organization (WHO) reports that 50-70% of patients do not adhere to antihypertensive therapy, which can hinder optimal blood pressure control. In addition, body mass index (BMI) is an important factor This study aimed to examine the association between medication adherence and body mass index among elderly patients with hypertension in the working area of the UPTD Motoboi Kecil Health Center.
**Methods:** This study employed a quantitative analytic design with a cross-sectional approach. A total of 76 respondents were selected using purposive sampling based on predefined inclusion and exclusion criteria. Medication adherence was measured using the Morisky Medication Adherence Scale (MMAS-8), and BMI was assessed through direct measurement of weight and height. Data were analyzed using the Chi-square test to determine the association between variables.
**Results:** The findings showed that 52.6% of respondents were categorized as non-adherent to medication, while 39.5% had underweight BMI. Statistical analysis revealed a significant association between medication adherence and BMI ($p < 0.001$).
**Conclusion:** Medication adherence is significantly associated with body mass index among elderly patients with hypertension, indicating that adherence to treatment may reflect broader health behaviors influencing nutritional status. These findings highlight the importance of integrating adherence support and routine nutritional assessment into hypertension management in primary healthcare settings.

**Keywords:** Medication adherence; body mass index; hypertension; elderly

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## Introduction

Hypertension remains a major global public health concern, particularly among the elderly population. According to the American Heart Association (AHA), approximately 74.5 million individuals over the age of 20 in the United States are affected by hypertension, with nearly 95% of cases classified as primary hypertension with no clearly identified cause (American Heart Association (AHA)). Furthermore, the World Health Organization (WHO) reports that approximately 50-70% of patients do not adhere to prescribed antihypertensive treatment, which poses a significant barrier to achieving optimal blood pressure control (WHO, 2023).

In Indonesia, hypertension prevalence continues to increase and represents a substantial burden on the healthcare system. Based on the 2018 national health profile, the prevalence of hypertension reached 34.11%, with higher rates observed in several provinces, including North Sumatra (44.13%), West Java (39.3%), and West Kalimantan (36.99%). The prevalence further increases with age, reaching 55.2% among individuals aged 55-64 years, 63.2% among those aged 65-74 years, and 69.5% among individuals over 75 years (Ministry of Health of the Republic of Indonesia, 2018). In addition, Riskesdas

2019 reported that a large proportion of hypertension cases remain undiagnosed. One of the key modifiable risk factors for hypertension is overweight and obesity, which are commonly assessed using Body Mass Index (BMI). BMI serves as a simple and widely used indicator of nutritional status and has been shown to be directly associated with increased blood pressure, particularly when BMI exceeds 25.

Previous studies have demonstrated that excessive BMI contributes to the development and progression of hypertension (Tarigan et al., 2021). Effective blood pressure management involves both lifestyle modifications and pharmacological interventions. Lifestyle approaches such as maintaining a balanced diet, engaging in regular physical activity, and managing stress are essential components of hypertension control (Federik, 2020). Additionally, BMI monitoring plays a critical role in maintaining stable blood pressure among hypertensive patients (Miraharini, 2020). Pharmacological therapy remains a cornerstone in hypertension management; however, its effectiveness is highly dependent on patient adherence to medication regimens (Mangendai et al., 2017; Listiana et al., 2020). High BMI is consistently associated with elevated blood pressure, while weight reduction has been shown to improve lipid profiles and overall quality of life (Darmawati, 2015; Abdur Rivai et al., 2021).

At the regional level, data from BPS North Sulawesi (2022) indicate that the prevalence of hypertension among individuals aged over 65 years reached 35.2%. Meanwhile, data from the Ministry of Health in 2023 show that the prevalence of hypertension in Kotamobagu City reached 34.2%, with an average population BMI of 23.5%. Medication adherence is a complex health behavior influenced by multiple factors, including lifestyle, dietary patterns, and physical activity. Poor dietary habits, in particular, can contribute to increased BMI and subsequently worsen hypertension outcomes (Liberty, 2019). Previous research by Ringgo Alfarisi (2023) reported a significant relationship between medication adherence, BMI, and blood pressure among elderly patients with hypertension ($p<0.05$).

However, despite existing evidence on the independent roles of BMI and medication adherence in hypertension management, studies that specifically examine the relationship between these two variables among elderly populations at the primary healthcare level remain limited, particularly in local community health center settings. Moreover, variations in socio-demographic characteristics, health behaviors, and access to healthcare services may influence this relationship, highlighting the need for context-specific investigations.

A preliminary study conducted on July 8, 2024, at the UPTD Motoboi Kecil Health Center identified 228 cases of hypertension among the elderly between April and June 2024. Of these, 84 elderly patients were recorded, and 30 individuals had a high BMI. Further assessment of 10 elderly patients revealed that 3 individuals had a BMI >27 accompanied by elevated blood pressure. Interviews indicated low medication adherence, limited family support and education, high salt intake, low physical activity, and inadequate fiber consumption. These findings suggest the presence of interrelated behavioral and clinical factors that may influence hypertension outcomes in this population.

Therefore, this study aims to analyze the association between medication adherence and Body Mass Index (BMI) among elderly patients with hypertension in the working area of the UPTD Motoboi Kecil Health Center.

## Methods

### Study Design

This study employed a quantitative analytic design using a cross-sectional approach, in which data on medication adherence and Body Mass Index (BMI) were collected simultaneously at a single point in time to examine the association between variables (Langingi, 2020). This design is appropriate for identifying relationships between variables within a relatively short period and in a specific setting.

### Samples

The study population consisted of patients with hypertension in the working area of the UPTD Motoboi Kecil Health Center. The sampling technique used was non-probability sampling with a purposive sampling approach, in which participants were selected based on predefined inclusion and exclusion criteria relevant to the research objectives. This approach was chosen to ensure that the selected respondents met specific clinical and demographic characteristics required for the study.

A total of 76 respondents were included in this study. The inclusion criteria were: (1) willingness to participate as respondents, (2) aged over 30 years, (3) diagnosed with hypertension and undergoing treatment at the UPTD Motoboi Kecil Health Center, and (4) currently receiving antihypertensive therapy for at least the last two months. The exclusion criteria included: (1) patients with hypertension accompanied by severe complications such as chronic kidney failure and coronary heart disease, and (2) respondents under 30 years of age.

### Instruments

Medication adherence was measured using the Morisky Medication Adherence Scale (MMAS-8) questionnaire adopted from Riani (2021), consisting of 8 items. The instrument uses an ordinal scale, where respondents select answers that best reflect their actual behavior regarding medication use. The MMAS questionnaire has been widely used to assess medication adherence in hypertensive patients. In this study, the instrument was adopted from a previously validated source (Riani, 2021), ensuring its suitability for measuring adherence behavior in the study population. Body Mass Index (BMI) was measured directly by the researcher using standardized equipment. Body weight was measured using a calibrated weighing scale, and height was measured using a microtoise. BMI was calculated as weight in kilograms divided by height in meters squared ($kg/m^2$).

### Data Collection

Data collection consisted of primary and secondary data. Primary data were obtained directly from respondents through questionnaires and physical measurements. The researcher first identified eligible participants based on inclusion criteria, then provided an explanation regarding the study objectives, procedures, and how to complete the questionnaire. Respondents who agreed to participate were asked to sign an informed consent form. Subsequently, respondents completed the MMAS questionnaire. The researcher also measured respondents' weight and height to calculate BMI. Completed questionnaires were checked for completeness before proceeding to data processing and analysis. Secondary data were obtained from medical records and reports available at the UPTD Motoboi Kecil Health Center to support the research findings.

### Data Analysis

Data analysis was conducted using univariate and bivariate approaches. Univariate analysis was used to describe respondent characteristics and study variables, presented in the form of frequency distributions and percentages (Notoatmodjo, 2019). Bivariate analysis was performed to examine the association between medication adherence and BMI among elderly patients with hypertension. The statistical test used was the Chi-Square test, with a significance level determined according to standard statistical criteria to test the research hypothesis.

### Ethical Considerations

This study was conducted in accordance with ethical principles in research involving human subjects. Prior to data collection, respondents were provided with a clear explanation of the study objectives, procedures, potential risks, and benefits. Written informed consent was obtained from all participants before their inclusion in the study. Confidentiality and anonymity of respondent data were strictly maintained throughout the research process..

## Results

Table 1 presents the distribution of respondents by age. Of the 76 respondents, 17 respondents (22.4%) were aged 45-59 years, 21 respondents (27.6%) were aged 60-75 years, and 38 respondents (50.0%) were aged 76-85 years.

Table 1. Distribution of Respondents by Age (n = 76)

| Age Group (years) | n | % |
|---|---|---|
| 45-59 | 17 | 22.4 |
| 60-75 | 21 | 27.6 |
| 76-85 | 38 | 50.0 |
| Total | 76 | 100.0 |

Source : SPSS Processed Data, 2025

Table 2 presents the distribution of respondents by gender. Of the 76 respondents, 25 respondents (32.9%) were male and 51 respondents (67.1%) were female.

Table 2. Distribution of Respondents by Gender (n = 76)

| Gender | n | % |
|---|---|---|
| Male | 25 | 32.9 |
| Female | 51 | 67.1 |
| Total | 76 | 100.0 |

Source : SPSS Processed Data, 2025

Table 3 presents the distribution of respondents by education level. Of the 76 respondents, 14 respondents (18.4%) had no formal education, 39 respondents (51.3%) had primary school education, 12 respondents (15.8%) had junior high school education, 8 respondents (10.5%) had senior high school/vocational education, and 3 respondents (3.9%) had college/university education.

Table 3. Distribution of Respondents by Education Level (n = 76)

| **Education Level** | **n** | **%** |
|---|---|---|
| No formal education | 14 | 18.4 |
| Primary school | 39 | 51.3 |
| Junior high school | 12 | 15.8 |
| Senior high school/Vocational | 8 | 10.5 |
| College/University | 3 | 3.9 |
| Total | 76 | 100.0 |

Source : SPSS Processed Data, 2025

Table 4 presents the distribution of respondents by occupation. Of the 76 respondents, 7 respondents (9.2%) were self-employed, 3 respondents (3.9%) were civil servants, 4 respondents (5.3%) were farmers, 29 respondents (38.2%) were housewives, and 33 respondents (43.4%) were unemployed.

Table 4. Distribution of Respondents by Occupation (n = 76)

| **Occupation** | **n** | **%** |
|---|---|---|
| Self-employed | 7 | 9.2 |
| Civil servant | 3 | 3.9 |
| Farmer | 4 | 5.3 |
| Housewife | 29 | 38.2 |
| Unemployed | 33 | 43.4 |
| Total | 76 | 100.0 |

Source : SPSS Processed Data, 2025

Table 5 presents the distribution of medication adherence. Of the 76 respondents, 40 respondents (52.6%) were categorized as non-adherent and 36 respondents (47.4%) were categorized as adherent.

Table 5. Distribution of Medication Adherence (n = 76)

| **Medication Adherence** | **n** | **%** |
|---|---|---|
| Non-adherent | 40 | 52.6 |
| Adherent | 36 | 47.4 |
| Total | 76 | 100.0 |

Source : SPSS Processed Data, 2025

Table 6 presents the distribution of Body Mass Index (BMI). Of the 76 respondents, 22 respondents (28.9%) had normal BMI, 30 respondents (39.5%) were underweight, and 24 respondents (31.6%) were overweight.

Table 6. Distribution of Body Mass Index (BMI) (n = 76)

| **BMI Category** | **n** | **%** |
|---|---|---|
| Normal | 22 | 28.9 |
| Underweight | 30 | 39.5 |
| Overweight | 24 | 31.6 |
| Total | 76 | 100.0 |

Source : SPSS Processed Data, 2025

The mean BMI of respondents was 23.5 ± 3.8 kg/m².

Table 7 presents the association between medication adherence and BMI. Among non-adherent respondents, 3 respondents (3.9%) had normal BMI, 13 respondents (17.1%) were underweight, and 24 respondents (31.6%) were overweight. Among adherent respondents, 19 respondents (25.0%) had normal BMI, 17 respondents (22.4%) were underweight, and no respondents were classified as overweight.

Table 7. Association Between Medication Adherence and BMI (n = 76)

| Medication Adherence | Normal n (%) | Underweight n (%) | Overweight n (%) | Total n (%) |
|---|---|---|---|---|
| Non-adherent | 3 (3.9) | 13 (17.1) | 24 (31.6) | 40 (52.6) |
| Adherent | 19 (25.0) | 17 (22.4) | 0 (0.0) | 36 (47.4) |
| Total | 22 (28.9) | 30 (39.5) | 24 (31.6) | 76 (100.0) |

Source : SPSS Processed Data, 2025
The Chi-square test showed a p-value of 0.000.

## Discussion

### Respondent Characteristics

The age distribution in this study indicates that the majority of respondents were in the older age group (76-85 years). This finding reflects the increasing burden of hypertension with advancing age, which is consistent with previous studies (Fifi Ratnawati, 2021). From a physiological perspective, aging is associated with progressive vascular changes, including endothelial dysfunction and increased arterial stiffness, which contribute to elevated blood pressure (Nuraini, 2015). The classification of late adulthood as described by the Ministry of Health of the Republic of Indonesia (2019) further supports that individuals in this age group are more vulnerable to chronic conditions. Although age itself is not a direct determinant of medication adherence, age-related decline in physical and cognitive function may indirectly influence an individual's ability to manage long-term therapy.

In terms of gender, the higher proportion of female respondents is consistent with the broader epidemiological pattern reported by WHO, where hypertension prevalence tends to be higher among older women. This condition is often associated with hormonal changes, particularly the decline in estrogen levels after menopause, which reduces cardiovascular protection. These biological mechanisms may increase susceptibility to hypertension and related complications in elderly women.

Education level in this study was predominantly at the primary school level, indicating generally low educational attainment among respondents. From a behavioral perspective, education plays an important role in shaping health literacy and influencing health-related decision-making (Notoatmodjo, 2019). Individuals with lower educational levels may have limited understanding of disease management, including the importance of consistent medication use and lifestyle modification, which can affect long-term treatment outcomes.

Regarding occupation, most respondents were unemployed. While having more time may theoretically allow better self-care, limited economic resources may restrict access to healthcare services, medications, and adequate nutrition. This condition highlights the complex interaction between socioeconomic status and health behavior, particularly in chronic disease management.

### Medication Adherence

The findings indicate that more than half of the respondents were categorized as non-adherent to medication. Rather than merely reflecting individual behavior, medication adherence can be understood through a broader behavioral framework involving predisposing, enabling, and reinforcing factors, such as knowledge, motivation, family support, and access to healthcare services. Previous studies (Siska Ariani, 2022; Ringgo Alfarisi, 2023) have shown that forgetfulness, lack of reminders, and limited support systems are common barriers among elderly patients. These factors suggest that adherence is not solely determined by patient intention, but also by environmental and systemic influences.

### Body Mass Index (BMI)

The distribution of BMI in this study shows a predominance of underweight respondents, followed by overweight and normal categories. This pattern suggests a dual burden of malnutrition among elderly patients with hypertension. Physiological changes associated with aging, such as decreased appetite, impaired digestion, and altered metabolism, may contribute to lower BMI (Miraharini, 2019). At the same

time, imbalanced dietary intake and reduced physical activity can also lead to overweight conditions in some individuals. This variability indicates that BMI in elderly populations is influenced by a combination of biological, behavioral, and social factors.

**Association Between Medication Adherence and BMI**

The statistical analysis demonstrated a significant association between medication adherence and BMI ($p < 0.05$). This finding suggests that adherence to antihypertensive therapy is linked not only to blood pressure control but also to broader health outcomes, including nutritional status.

From a clinical perspective, adherence to medication may reflect a more comprehensive pattern of health behavior. Individuals who adhere to prescribed treatment are more likely to follow other recommendations, such as maintaining a balanced diet and engaging in physical activity, which can contribute to a more stable BMI. Conversely, non-adherence may be associated with poorer overall self-management, leading to irregular dietary patterns, reduced physical activity, and subsequent changes in body weight.

The relationship between medication adherence and BMI can also be explained through underlying physiological mechanisms. Poorly controlled hypertension due to non-adherence may lead to complications that affect metabolic processes, physical capacity, and appetite regulation. In contrast, effective treatment may help maintain cardiovascular stability, enabling individuals to sustain better functional status and nutritional balance.

These findings are consistent with previous studies (Ringgo Alfarisi, 2023; Siska Ariani, 2022), which reported a relationship between medication adherence, BMI, and blood pressure. However, the present study provides additional context by focusing on elderly patients in a primary healthcare setting, where factors such as limited resources, family support, and access to care may play a significant role.

The results of this study have important practical implications. Improving medication adherence among elderly patients may require a comprehensive approach that includes patient education, family involvement, and support from healthcare providers. In addition, regular monitoring of BMI should be integrated into hypertension management to identify potential nutritional problems early and provide appropriate interventions.

## Conclusion

This study demonstrates a significant association between medication adherence and body mass index among elderly patients with hypertension. These findings highlight that medication adherence is not only essential for blood pressure control but is also closely related to the overall health and nutritional status of patients. From a clinical perspective, the results underscore the importance of integrating adherence support into hypertension management, including patient education, family involvement, and continuous monitoring by healthcare providers. In addition, routine assessment of body mass index should be considered as part of comprehensive care to identify nutritional risks and support better health outcomes among the elderly. Overall, this study contributes to the understanding of the interconnected role of treatment adherence and nutritional status in managing hypertension, particularly in primary healthcare settings.

## References

A. Karim, M., Syamsuddin, F. ., & Pakaya, A. W. . (2024). The Effect of Green Color Therapy on Lowering Blood Pressure in the Elderly with Hypertension. *Omni Health Journal*, *1*(1), 14-20. https://doi.org/10.65277/ohj.v1i1.11

Abdur Rivai, et al. (2021). Relationship of compliance with medication in hypertension patients. *Journal of Public Health Science Research*.

Agus, A. I., & Rosmiati. (2025). Association of Family Support with Treatment Adherence in Tuberculosis Patients. *Omni Health Journal*, *3*(1), 1-7. https://doi.org/10.65277/ohj.v3i1.233

Agus, A. I., & Rosmiati. (2025). Knowledge Level and Treatment Adherence among Pulmonary Tuberculosis Patients: A Cross-Sectional Study. *Omni Nursing Journal*, *2*(4), 100-105. https://doi.org/10.65277/onj.v2i4.234

Alifariki, L. O. (2019). *Epidemiology of hypertension: A research-based review.*

Ardila, L., & Munir, N. W. . (2025). Association Between Blood Sugar Levels and Blood Pressure in Individuals with Diabetes Mellitus: A Cross-Sectional Study. *Omni Nursing Journal*, *2*(1), 12-17. https://doi.org/10.65277/onj.v2i1.137

Ardiyandika, N. N. (2019). Factors related to treatment adherence among hypertension patients at Posbindu PTM, Sidoarjo Village, Geneng District, Ngawi Regency. *STIKES Bhakti Husada Mulia Madiun.*

Athiqotul Himmah. (2021). The relationship between body mass index and blood pressure. *Walisongo State Islamic University*.

Cahyono, L. (2023). Journal of health science and practice development.

Darmawati. (2015). The relationship between spirituality level and blood pressure in hemodialysis patients at Taman Husada Bontang Hospital. *Journal of Chemical Information and Modeling.*

Darmojo, B. (2019). *Epidemiology of hypertension: A research-based review*. Leutika Prio.

Dewi Ayuningtyas. (2022). The relationship between knowledge level and adherence to antihypertensive medication among hypertension patients at Mulyasari Hospital, North Jakarta. *University of 17 August 1945*.

Ellis, D. (2020). The effect of family social support on the quality of life of the elderly at the Ria Pembangunan Nursing Home, East Jakarta.

Eri Riana Pertiwi. (2024). Analysis of the Application of Deep Breathing Relaxation Techniques in Reducing Blood Pressure in Hypertension Patients. *Omni Health Journal*, *1*(2), 40-45. https://doi.org/10.65277/ohj.v1i2.45

Fenti Umami. (2021). The relationship between body mass index and hypertension in pre-elderly aged 45-55 years in Kaliwungu Village, Jombang Regency.

Huda, B., et al. (2020). Analysis of the availability of antihypertensive drugs and its effect on hypertension treatment at community health centers in Bandar Lampung City. https://doi.org/2541-0849

Inggara, R. A., Ririnisahawaitun, & Sari, A. S. (2024). Relationship Between Stress Levels and Sleep Quality with Hypertension Incidence in Elderly Individuals. *Omni Nursing Journal*, *1*(4), 122-128. https://doi.org/10.65277/onj.v1i4.151

Kholifah. (2019). *Gerontic nursing*.

Ministry of Health of the Republic of Indonesia. (2019). *Basic health research (Riskesdas). Health Research and Development Agency.*

Ringgo Alfarisi. (2023). The relationship between medication adherence, body mass index, and blood pressure among elderly patients with hypertension. *Malahayati Medical Journal, 7*(2).

Rumba, S., Abudin, L. S., & Umamity, S. (2024). The Relationship Between Family Support and the Stage of Hypertension in the Elderly. *Omni Nursing Journal*, *1*(1), 30-36. https://doi.org/10.65277/onj.v1i1.7

Salsa Sasmita Ismail, Mulyadi, M., & Watung, G. I. (2025). The Relationship between Sleep Quality and Physical Fatigue in the Elderly. *Omni Health Journal*, *2*(1), 17-21. https://doi.org/10.65277/ohj.v2i1.79

Siska Nabila Ariani. (2022). The relationship between medication adherence, blood pressure control, and quality of life in hypertension patients. *Sultan Agung Islamic University.*

World Health Organization. (2023). Hypertension. https://www.who.int/news-room/fact-sheets/detail/hypertension