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Self-Care and Treatment Adherence for Blood Pressure Control among Patients with Hypertension: a Cross-sectional Study

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ABSTRACT

The prevalence of hypertension is increasing every year. The keys of full success in controlling blood pressure among patients with hypertension were self-care and medication adherence. The research problem was that patients with hypertension still had inadequate self-care skills and were not compliant with treatment regimens. The aim of the study was to analyze the association between self-care and medication adherence with blood pressure control among patients with hypertension. The method, design of the study was cross-sectional. Primary data collection was conducted in outpatient wards at Type A Hospital, Bandung-Indonesia with accidental sampling technique. Period of data collection was February-March 2025. Total sample involved 138 respondents. The instruments used in this study were High Blood Pressure-Self-care Profile (HBP-SCP) and Modified-Morisky Adherence Scale-8 (MMAS-8). The statistical test used was Chi-Square. Results: We found 82.0% respondents with low self-care, 86.0% not adhere to medication, and 66.0% respondents with uncontrolled blood pressure. The results of the study showed there was a significant association between self-care and blood pressure control (P < .001), medication adherence and blood pressure control among patients with hypertension (P < .001). Recommendations related to improving self-care and medication adherence need to be evaluated periodically, support from health care professionals through ongoing health education or the use of appropriate technology needs to be carried out to monitor the self-care abilities of hypertension sufferers to avoid various complications.

ABSTRAK

Prevalensi hipertensi setiap tahunnya meningkat. Kunci keberhasilan pengendalian tekanan darah yaitu kemampuan *self-care* dan kepatuhan pengobatan. Masalah penelitian masih ditemukan penderita hipertensi yang memiliki kemampuan *self-care* yang kurang memadai dan tidak patuh terhadap rejimen pengobatan. **Tujuan**: menganalisis hubungan *self-care* dan kepatuhan pengobatan dengan pengendalian tekanan darah penderita hipertensi. **Metode**: desain studi *cross sectional*. Pengumpulan data primer penderita hipertensi yang rawat jalan di Poli Ginjal dan Hipertensi RS Tipe A Bandung dengan teknik *accidental sampling*. Periode Februari-Maret 2025. Besar sampel dalam studi 138 responden. Instrumen penelitian *High Blood Pressure-Self-care Profile* (HBP-SCP) dan *Modified-Morisky Adherence Scale*-8 (MMAS-8). Uji statistik yang digunakan *Chi-Square*. **Hasil**: Terdapat 82.0% responden dengan kemampuan *self-care* rendah, 86.0% responden dengan kepatuhan pengobatan rendah, dan 66.0% responden dengan tekanan darah tidak terkendali. Hasil studi diperoleh hubungan yang signifikan antara *self-care* dengan pengendalian tekanan darah pada penderita hipertensi (P < .001) dan kepatuhan pengobatan dengan pengendalian tekanan darah penderita hipertensi (p < .001). Rekomendasi studi terkait peningkatan *self-care* dan kepatuhan pengobatan perlu dievaluasi secara

berkala, dukungan petugas kesehatan melalui pendidikan kesehatan berkelanjutan atau pemanfaat teknologi tepat guna perlu dilakukan untuk memantau kemampuan perawatan diri penderita hipertensi agar terhindar dari berbagai komplikasi..

A. INTRODUCTION

Hypertension has become a global health problem. An estimated 1.28 billion adults aged 30-79 years worldwide suffer from hypertension, the majority (two-thirds) living in low- and middle-income countries. An estimated 46% of adults with hypertension are unaware that they have the disease. Less than half of adults (42%) with hypertension are diagnosed and treated. Hypertension is a leading cause of premature death worldwide. One of the global targets for non-communicable diseases is to reduce the prevalence of hypertension by 33% between 2010 and 2030 (World Health Organization [WHO], 2023).

Data from Riset Kesehatan Dasar (Riskesdas) Republik Indonesia (RI) (2018) prevalence of hypertension in the population aged > 18 years is 25.8%. West Java is in the top three provinces with the highest number of hypertension sufferers nationally compared to other provinces such as Bangka Belitung, South Kalimantan, and East Kalimantan. Hypertension with complications (5.3%) is the 5th (fifth) cause of death at all ages.

Hypertension needs treatment, implementing a healthy lifestyle massively throughout life. Many factors play a role in the ineffectiveness of hypertension control such as lack of patient participation (self-care) in managing the disease such as still high sodium consumption, lack of stress management, stopping smoking habits have contributed to the incidence of hypertension. In addition, low adherence with drug use, lack of health care professionals intervention regarding lifestyle modification due to limited time and resources and lack of health systems in managing chronic diseases also play a role in controlling hypertension (WHO, 2023).

Data Riskesdas RI (2018) also revealed that 45.6% of patients were still poorly compliant with blood pressure lowering medication and this was the main reason for poor disease control. Thus, more than half of people treated for cardiovascular disease had uncontrolled blood pressure. The study conducted by Ramadhan MD (2023)It was obtained information that there was still low adherence with treatment (48.6%) in patients with cardiovascular and blood vessel diseases in a hospital in West Java, Indonesia. Furthermore Kang et al (2018) analyzed that there is a relationship between stress and medication adherence with blood pressure control. Other studies Fathia et al (2019)also found that 58.3% of hypertension sufferers were not compliant with treatment.

Based on the description, it is important to further assess the main elements in controlling hypertension disease in addition to medication adherence, namely self-care. The term self-care is defined as an effort to implement a healthy lifestyle or pattern in the context of controlling hypertension. It is expected that sufferers, in addition to regular consumption of

antihypertensive drugs, need to be supported by a good diet, regular exercise and avoiding cigarettes (WHO, 2023).

The study was conducted by Istianah et al (2023) *self-care* proven to have a strong correlation to blood pressure control. This randomized study stated that the recommended self-care program has an impact on reducing morbidity and mortality due to hypertension. Another study by Fathia et al (2019) analyzing low self-care in hypertension patients has contributed to a high risk of complications with the results obtained being 58.3%. The prevalence of low self-care is 59.4%. Poor hypertension control can have an impact on decreasing quality of life.

The results of a study conducted by Bolin et al (2018) information was obtained that adherence with low salt or sodium diet consumption was still low, 74% did not comply with the low salt diet. The impact of non-adherence with this diet can result in increased sodium levels. When sodium levels are excessive in the blood, water is retained, resulting in increased blood volume and pressure on the arterial walls. Furthermore, a qualitative study by Moss et al (2019) The perspective of 31 respondents diagnosed with hypertension, the main stressors of hypertension control are self-care, diet type and the need for rest and sleep.

Although it has been proven that there is an association between self-care and medication adherence with blood pressure control, the study conducted by this researcher is still needed to periodically evaluate the factors that influence the success of hypertension treatment so that researchers were interested in conducting a study entitled "Self-Care and Treatment Adherence for Blood Pressure Control among Patients with Hypertension: a Cross-sectional Study". This study aimed to analyze the association between self-care and adherence with blood pressure control among patients with hypertension.

B. METHOD

The researcher used an observational analytical research design with a cross-sectional approach. Primary data collection from patients with hypertension who were outpatients at the Kidney and Hypertension Polyclinic, Anggrek Building, 2nd Floor, Type A Hospital, Bandung-Indonesia using the accidental sampling technique. The study was conducted in February-March 2025. The minimum sample was calculated using G-Power, which was 100 respondents.

1. Inclusion criteria:
   a. Adult patients aged > 30 years.
   b. Has been diagnosed with primary hypertension and recorded in the medical record.
2. Exclusion criteria:
   a. Hypertension during pregnancy
   b. Patients with a history of stroke, coronary revascularization in the last 3 months
   c. Hearing problems

   (Fathia et al, 2019)

This study used the Modified-Morisky Adherence Scale-8 (MMAS-8) questionnaire to assess medication adherence. This questionnaire is a short and validated measuring instrument (r count [> 0.373] > r table [0.30]) and Cronbach alpha test > 0.6. which can be used to identify medication adherence among patients with hypertension. This questionnaire

consists of 8 questions. Interpretation of scores≥8 (high adherence), score 6 - <8 medium adherence category, and score < 6 low adherence category (Shalansky et al., 2004 cited Ramadhan MD et al, 2023).

Instrument of *self-care*, researchers used the High Blood Pressure-Self-care Profile (HBP-SCP) based on a theoretical approach to assess self-care behavior, motivation and self-efficacy among patients with hypertension. The HBP-SCP can be used together or separately and is relatively short (20 items for each scale). This instrument was validated with a total item correlation above 0.15 and an alpha coefficient above 0.70 considered acceptable.

The HBP-SCP questionnaire was adopted by Han et al (2014) and previously not available in the Indonesian version so that researchers have conducted psychometric tests or cross cultural adaptation. The stages carried out were the questionnaire was translated into the Indonesian version by a Sworn Translator, then a content validity test was carried out by 4 expert judgments, namely one lecturer expert in statistics, two lecturers in the field of medical-surgical nursing, one clinical practitioner expert in internal medicine, by assessing each question from the clarity of words and sentences, the suitability of the item with the concept and the suitability of the item with the target population by giving a value of 1 (not relevant), a value of 2 (somewhat relevant), a value of 3 (quite relevant), and a value of 4 (relevant). This instrument was considered to have adequate content validity because it was calculated using the content validity coefficient - Aiken's V ranging from 0-1 (Hendryadi, 2017).

After conducting the content validity test, the researcher conducted a pilot study on 10 respondents. The results of the pilot study obtained an I-CVI value = 1.00 and an average relevant proportion = 1.00, the I-CVI value must be 1.00 if there are five or fewer assessors. If there are six or more assessors, the standard can be looser, Ciske KL & Orem DE (1980) recommends that the I-CVI is not lower than 0.78 so that it can be concluded that this questionnaire was valid and can be used.

After the pilot study, the research conducted construct validity and reliability tests on the questionnaire items. This was done so that the data obtained would be accurate and reliable. The test was conducted with a 95% confidence interval. The validity test will be conducted on the basis of each question item with a minimum of 5 samples per item (Castellini G et al., 2017) where the questionnaire contains 20 questions so that the number of respondents for construct validity is 100 respondents.

The results of the construct validity of the HBP-SCP showed that the correlation coefficient of 20 questions with a total score of > 0.1966 so that all instrument items were declared valid, while the reliability analysis obtained a result of 0.771 using Alpha Cronbach (more than or equal to 0.6) so that the instrument is declared reliable (Sugiyono, 2015). For blood pressure, systolic blood pressure (SBP) and diastolic blood pressure (DBP) measurements were obtained using a calibrated sphygmomanometer. Blood pressure control was defined as blood pressure <140/90 mmHg.

In this study, the variables are described through univariate and bivariate analysis. Univariate analysis was presented using tables and frequency distributions and interpreted according to the results obtained. While bivariate analysis aimed to determine the significant association between two variables. The statistical test used Chi-Square test.

The data collection procedure, starting from the researcher submitting a letter of request for research permission and submitting an ethics application with the number DP.04.03 / D.XIV.6.5 / 221/2025. After obtaining permission, the researcher prepared for data collection, the researcher determined the respondents according to the established criteria. Then the researcher collected primary data on respondents who visit to the polyclinic, after the respondents have been checked or treated. After all data collection was completed, patient data and information were analyzed so that conclusions were obtained from the study.

C. RESULTS AND DISCUSSION

1. RESULTS

a. Overview of Demographic Characteristics among Patients with Hypertension

Demographic characteristics based on age, marital status, education, type of employment, duration of suffering, smoking habits, body mass index can be seen in table 2.

Table 2. Overview of Demographic Characteristics among Patients with Hypertension

	Average (sb)	**IK 95%**	**n**	**%**
Age	52.43 (18.35)	18-82		
Marital status				
Marry			85	85.0
Not married yet			15	15.0
Education				
Elementary School			11	11.0
Junior High School			11	11.0
Senior High School			38	38.0
Diploma			5	5.0
Bachelor			35	35.0
Work				
civil servant			16	16.0
Self-employed			29	29.0
housewife			29	29.0
Laborer			4	4.0
Retired			17	17.0
State-owned Enterprises			2	2.0
Student			3	3.0
Long suffering				
≤1 year			13	13.0
2-5 years			35	35.0
>5 years			52	52.0

Smoking habit		
Yes	16	16.0
No	84	84.0
Body mass index		
Poor-Underweight	3	3.0
Underweight	8	8.0
Normalweight	40	40.0
Overweight	14	14.0
Obesity	35	35.0
	100	100.0

Source: Primary Data (2025)

b. Overview of Treatment Adherence among Patients with Hypertension

The description of adherence with treatment among patients with hypertension can be seen in table 2.

Table 2. Self-Care Overview among Patients with Hypertension

Selfcare	**n**	**%**
Low self-care	82	82.0
High self-care	18	18.0
	100	100

Source: Primary Data (2025)

Table 2 explained that the majority of patients with hypertension, 82.0%, interpreted as low self-care category.

c. Overview of Medication Adherence

The description of adherence with treatment of patients with hypertension in the study can be seen in Table 3.

Table 3. Overview of Treatment Adherence among Patients with Hypertension

Treatment Adherence	**n**	**%**
Low adherence	86	86.0
Moderate adherence	8	8.0
High adherence	6	6.0
	100	100

Source: Primary Data (2025)

Table 3 showed that the majority of 86.0% of respondents were in the low adherence category, further distribution of non-adherence can be seen per questionnaire item in Table 4.

Table 4. Overview of Questionnaire Questions Per Item Treatment Adherence among Patients with Hypertension

	Answer			
	Yes		No	
	n	%	n	%
Have you ever forgotten to take your medicine?	43	43.0	57	57.0
During the past two weeks, was there a day when you forgot to take your medication?	67	67.0	33	33.0
Have you ever reduced or stopped taking a medication without telling your health care professional because you felt worse while taking the medication?	80	80.0	20	20.0
When traveling, do you forget to bring your medication?	80	80.0	20	20.0
Have you taken your medicine yesterday?	16	16.0	84	84.0
When symptoms do not appear, do you ever stop treatment?	80	80.0	20	20.0
Do you feel bored with the daily routine of taking medication?	55	55.0	45	45.0
How difficult is it for you to remember to take your medication?	n (%)			
a. Never	51 (51.0)			
b. Very	10 (10.0)			
c. Sometimes	37 (37.0)			
d. Often	2 (2.0)			
e. Always	0 (0)			

Source: Primary Data (2025)

d. Overview of Blood Pressure Control for Patients with Hypertension

The description of blood pressure control among patients with hypertension can be seen in table 5.

Table 5. Overview of Blood Pressure Control among Patients with Hypertension

	n	**%**
Systolic and Diastolic BP		
Under Control	34	34.0
Uncontrollable	66	66.0
	100	100.0

Source: Primary Data (2025)

Table 5 shows that there were 66.0% of respondents in the uncontrolled blood pressure category.

e. The Association between Self-Care and Medication Adherence with Blood Pressure Control in Hypertension Patients

The association between self-care and medication adherence with blood pressure control among patients with hypertension can be seen in table 6.

Table 6. Association between self-care and medication adherence with control blood pressure among patients with hypertension.

	Blood Pressure Control				**p-value**
	Uncontrolled BP		Controlled BP		
	n	%	n	%	
Self-care					
Low self-care	62	75.6	20	25.4	.001
High self-care	4	28.5	14	71.5	
Medication adherence					
Low	63	73.2	23	27.8	.001
Moderate	1	12.5	7	87.5	
High	2	33.3	4	66.7	
Total	66	66.0	34	34.0	

Source: Primary Data (2025)

Table 6 showed that there was a significant relationship between self-care and medication adherence with blood pressure control (P value < 0.001).

2. Discussion

This study found that there was a relationship between self-care and blood pressure in hypertension. This research was in line with that carried out by researchers Mahfud et al (2019) There is a close relationship between self-care and systolic blood pressure with a p value of 0.001 < α 0.05. Research carried out by Juliana et al (2023) with a p value of 0.001, h0 was rejected, which means there was a significant relationship between self-care and blood pressure status in hypertension.

This research was also in line with previous research conducted in Lestari & Isnaini (2018) stated that there was a significant influence between self-care on systolic blood pressure in hypertension patients at Posbindu Dukuhturi, Bumiayu District, Brebes Regency with a p-value of 0.001 (<α = 0.05) and a correlation coefficient (r) = -0.559. The higher the self-care, the lower the blood pressure of the elderly, the lower the self-care management, the higher the blood pressure of the elderly who experience hypertension.

The association between self-care and systolic blood pressure in people with high blood pressure was also explained in this research. Firgiawanty et al (2022) This was indicated by the regression coefficient value of -0.801 for every 1 unit increase in self-care will decrease systolic blood pressure by 0.801 units. The p value of 0.001 <0.05 indicated that self-care had an effect on systolic blood pressure in hypertensive patients.

Self-care is a broad term with broad global application and cross-disciplinary utility. Self-care as "the ability of individuals, families, and communities to promote health, prevent illness, maintain health, and cope with illness and disability with or without the support of

health services. Providers (Riegel B et al, 2016). It is also seen as a means to address financial pressures on the health care system and the lack of health care coverage (Iribarren et al, 2017). With more than 50% of the world's population lacking access to formal health services and more than 50% of adults with one or more chronic diseases (Riegel B et al, 2016), self-care is often the only way to achieve these goals, improving and maintaining health and well-being.

Self-care in chronic illness is related to maintaining appropriate levels of physical and psychological well-being, reducing morbidity and mortality and the use and costs of health services, increasing patient satisfaction, increasing the sense of control and quality of life, reasons why self-care is a primary concern in the care of people with chronic illness (Han et al, 2014).

The concept of self-care has evolved over the years. It is related to the autonomy, independence and responsibility of individuals towards healthy behaviors, as well as the development of activities necessary to manage and monitor health conditions. The experience of illness requires people to integrate practices and recommendations into their self-care, to maintain the best possible well-being. Promoting self-care is essential in chronic illness by involving activities and skills that individuals must learn and use to improve their quality of life (Han et al, 2014; Shahaj et al, 2019).

Effective hypertension self-care is associated with a number of positive outcomes, the strength of which may be equal to or greater than those seen with drug therapy. Data from randomized controlled trials of hypertension disease management programs that included self-care promotion as part of their services showed that readmission rates and mortality were reduced. These gains may be sustained for months to years, especially when education and other strategies to promote self-care are included. Several trials have not demonstrated an effect of disease management on mortality or readmissions compared with usual care. This may be due to the lack of treatment that includes self-care strategies, the use of ineffective self-care strategies, or the duration of the intervention being too short to sustain its effects. Optimal outcomes and quality of life for patients with hypertension depend on engaging in effective self-care activities (Abegaz et al, 2017; Moss et al, 2019).

In hypertension, self-care refers to the behaviors a person develops to maintain their health (self-care maintenance) and the decisions they make about worsening symptoms when they occur (self-care management). Self-care maintenance involves adherence to pharmacological recommendations, consumption of a low-salt diet, cessation of tobacco use, restriction of alcohol consumption, daily monitoring of weight, signs or symptoms, and compensation. From this perspective, self-care is the decision-making process a patient uses in choosing behaviors that maintain physiological stability, and responding to symptoms when they occur (Han et al, 2014).

In cross-sectional studies, Bolin et al (2018) analyzed adherence with low-salt diet in hypertensive patients. This study used demographic and physiological data of 77 participants, and the data were obtained using the Multidimensional Health Locus of Control (LOC) scale and the Patient Health Question-9 Depression (PHQ-9) tool. The findings showed that women were more likely to have lower adherence with low-salt diet (n = 57, 74%) and a moderate

negative correlation ($r = -0.294$; $p < 0.01$) was found between high blood pressure and low blood pressure adherence with salt diet on PHQ-9.

This study also found that there was a relationship between medication adherence and blood pressure control.Studies conducted Fathia et al (2019) identified non-adherence to blood pressure lowering medication in an urban Tunisian outpatient population aged over 18 years. A sample of 170 participants were randomly selected for this study and Health Related Quality of Life (HRQL) of the sample participants was assessed using the MINICHAL questionnaire. The results showed that more than half (58.3%) of the participants were categorized as hypertensive, at very high risk of cardiovascular disease, and the prevalence of non-adherence was (59.4%, 95%; CI [52.3-67.1]). Multivariate analysis showed that low education level and no family support for treatment were associated with non-adherence. The results further showed that non-adherence to blood pressure lowering medication was not significantly associated with HRQL Score.

Kang et al (2018) analyzed the relationship between stress, adherence, and blood pressure control among black American women with hypertension ($n = 571$) who participated in the SisterTalk II intervention to improve adherence to non-pharmacological recommendations. The study found that stress was associated with higher SBP ($p = 0.029$), and that the intervention was effective because participants without blood pressure control had significantly higher stress scores than those with blood pressure control ($p = 0.043$). In addition, participants who adhered to non-pharmacological recommendations had lower SBP compared to participants who did not adhere to recommendations ($p < 0.001$). Thus, non-pharmacological adherence partially mediated the relationship between stress and blood pressure control.

The term adherence has two related meanings: (1) a specific research measure of the regularity with which patients take their medications, usually expressed as a proportion or percentage of prescribed days and (2) a more general definition perhaps best exemplified by the World Health Organization (WHO) report, “the extent to which a person's medication-taking behavior, following a diet, and/or making lifestyle changes corresponds to agreed-upon recommendations from a health care provider”(WHO ,2023).

Patient factors (i.e. characteristics that patients have that they can partially control) are among the risk factors that influence hypertension. For example, age, race, diet, literacy level, socioeconomic status and lifestyle choices are some of the patient factors that correlate with hypertension Neiman et al (2017). As patients age, hypertension becomes more difficult to control or manage, and may worsen.

The WHO report on medication adherence further describes five categories of factors that influence medication adherence: patient-related factors, socioeconomic factors, health team and system factors, therapy-related factors, and condition-related factors.. Information, beliefs, desires, and behaviors of patients related to the drugs they are given can have a strong impact on their adherence. Fear of side effects and poor understanding of the importance of treatment are common components associated with patients' nonadherence (Abu-El-Noor et al, 2021; Muhadi, 2016).

In some cases, the characteristics of the therapy itself may hinder patient adherence. This includes but is not limited to the patient's experience with side effects. Some patients

choose not to take their medication simply because of the decrease in their quality of life due to having to do so. The latest data from the instrument, we found that most respondents had forgotten to take their medication, had stopped taking their medication without telling their doctor when taking their medication because they felt worse, and when symptoms did not appear they decided to stop taking their medication (Abu-El-Noor et al, 2021; Muhadi, 2016).

Patients' knowledge, beliefs, expectations, and attitudes regarding their medications can have a strong effect on their adherence. Fear of side effects and poor understanding of the importance of medication are common factors associated with patient nonadherence. The extent to which these factors are modifiable is a subject of debate. On the one hand, one interesting study showed a negative correlation between adherence and media coverage of antihypertensive drug side effects, suggesting that patient attitudes about antihypertensive drugs are easily modifiable (D'Arcangelo, 2016).

D. CONCLUSION AND SUGGESTIONS

There was a significant relationship between self-care and medication adherence with blood pressure in hypertensive patients. Study recommendations related to improving self-care and medication adherence need to be evaluated periodically, support from health care professionals through ongoing health education or utilization of appropriate technology needs to be carried out to monitor the self-care ability of hypertensive patients to avoid various complications.

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