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Relationship between characteristics and self-care toward blood pressure in hypertensive patients

Relación entre las características y el autocuidado con respecto a la presión arterial en pacientes hipertensos

Adin Mu'afiro[1ac]*, Nursalam[2b], Sriyono[3b], Joko Suwito[4c], Sri Hidayati[5c]

SUMMARY

Introduction: *Successful hypertension management depends on patients' self-care abilities, including medication adherence, healthy lifestyle behaviors, and blood pressure monitoring, which may vary with age, gender, education, and duration of hypertension. The purpose of the study is to examine the relationships among characteristics, self-care maintenance, blood pressure monitoring, and management in hypertensive patients.*

Methods: *This study uses a descriptive cross-sectional design. The research sample consisted of 225 hypertensive patients from the J and T health centers in Surabaya. The independent variables include Characteristics, Self-Care of Maintenance, Monitoring, and Management, while the dependent variable is blood pressure. The instrument used is the Self-Care Hypertension Questionnaire, English Version 3 (SC-HiV3). Data analysis was performed using Spearman's rank correlation test ($p < 0.05$).*

Results: *No relationship was found between Gender ($p=0.736$), Age ($p=0.617$), Education ($p=0.996$), Duration of hypertension ($p=0.317$), self-care maintenance ($p=0.405$), self-care monitoring ($p=0.392$), and self-care management ($p=0.294$) and blood pressure. Most hypertensive patients, based on gender, age, education, and duration of illness, have grade 1 hypertension. Self-care maintenance for hypertensive patients was good in 58.7 % of cases and moderate in 39.1 %. Self-care monitoring for hypertensive patients was good in 44 % of cases. Self-care management among hypertensive patients was generally good, with 62.2 % reporting good self-care. The attributes include gender, age, educational attainment, and duration of hypertension. Self-care maintenance, monitoring, and management are unrelated to the blood pressure of hypertensive individuals. Most hypertensive patients are at grade 1 hypertension. Most hypertensive patients' self-care is at a reasonable or moderate level.*

Conclusion: *The study found no relationship between gender, age, education, duration of hypertension, or self-care aspects (maintenance, monitoring, and management) with blood pressure. Most hypertensive patients were classified as having grade 1 hypertension, with self-care levels ranging from good to moderate.*

Keywords: *Self-care, characteristics, blood pressure.*

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ORCID: 0000-0001-9093-0791[1]
ORCID: 0000-0002-9052-6983[2]
ORCID: 0000-0002-6533-1973[3]
ORCID: 0000-0002-4824-9791[4]
ORCID: 0009-0008-6577-3262[5]

[a]Doctoral Programme Student from the Faculty of Nursing, Universitas Airlangga Surabaya, Poltekkes Kemenkes Surabaya.
[b]Faculty of Nursing, Universitas Airlangga, Surabaya
[c]Poltekkes Kemenkes Surabaya

*Corresponding Author: Adin Mu'afiro, E-mail: adin.muafiro-2023@fkp.unair.ac.id

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RESUMEN

Introducción: *El manejo exitoso de la hipertensión depende de las capacidades de autocuidado de los pacientes, que incluyen la adherencia al tratamiento, un estilo de vida saludable y el control de la presión arterial, factores que pueden variar según la edad, el sexo, el nivel educativo y la duración de la hipertensión. El objetivo de este estudio fue analizar la relación entre las características, el autocuidado de mantenimiento, monitoreo y manejo con respecto a la presión arterial en pacientes hipertensos.*

Métodos: *El diseño fue descriptivo transversal. La muestra estuvo compuesta por 225 pacientes hipertensos de los centros de salud J y T en Surabaya. Las variables independientes incluyeron las características, el autocuidado de mantenimiento, el autocuidado de monitoreo y el autocuidado de manejo, mientras que la variable dependiente fue la presión arterial. El instrumento utilizado fue el Self-Care Hypertension Questionnaire English Version 3 (SC-HiV3). El análisis de los datos se realizó mediante la prueba de correlación de Spearman ($p<0.05$).*

Resultados: *Los resultados mostraron que no existe relación entre las variables de sexo (p=0,736), edad (p=0,617), nivel educativo (p=0,996), duración de la hipertensión (p=0,317), autocuidado de mantenimiento (p=0,405), autocuidado de monitoreo (p=0,392) y autocuidado de manejo (p=0,294) y la presión arterial. La mayoría de los pacientes hipertensos, según el sexo, la edad, la educación y la duración de la enfermedad, presentaron hipertensión de grado 1. El autocuidado de mantenimiento fue bueno en el 58,7 % de los casos y moderado en el 39,1 %. El autocuidado de monitoreo fue adecuado en el 44 % de los casos. El autocuidado de manejo fue principalmente bueno en el 62,2 %. Las características incluyen el sexo, la edad, el nivel educativo y la duración de la hipertensión. El autocuidado de mantenimiento, monitoreo y manejo no se relacionó con la presión arterial de los pacientes hipertensos. La mayoría de los pacientes presentaron hipertensión de grado 1, con niveles de autocuidado entre buenos y moderados.*

Conclusión: *El estudio no encontró relación entre el sexo, la edad, el nivel educativo, la duración de la hipertensión ni los aspectos del autocuidado (mantenimiento, monitoreo y manejo) y la presión arterial. La mayoría de los pacientes hipertensos fueron clasificados como de grado 1 y presentaron niveles de autocuidado que variaron de buenos a moderados.*

Palabras clave: *Autocuidado, características, presión arterial.*

INTRODUCTION

Hypertension is a prominent risk factor for cardiovascular disease and is recognized by the World Health Organization (WHO) as a leading cause of mortality in nearly all nations (1,2). This is attributable to the persistently elevated incidence of uncontrolled hypertension, notwithstanding breakthroughs in antihypertensive pharmacotherapy (3). This study presents novelty by integrating three key dimensions of self-care (maintenance, monitoring, and management) and examining their relationship with blood pressure using a validated instrument (SC-HiV3). Unlike previous studies that primarily focused on knowledge or medication adherence, this research offers a comprehensive perspective by linking patient characteristics to multidimensional self-care behaviors in the management of hypertension. Hypertension is prevalent in society and serves as a risk factor for cardiovascular disease, renal failure, diabetes, and cerebrovascular accidents. A considerable number of individuals with hypertension continue to have unstable blood pressure. Inadequate self-care is a contributing factor. Effective self-care practices are crucial for managing hypertension to reduce the risk of complications (4). Numerous individuals continue to regard hypertension as a prevalent condition due to its lack of lethal symptoms and minimal interference with daily activities. As a result, numerous patients have not engaged in self-care for hypertension and have suffered complications from postponed treatment (5), endangering the brain, eyes, heart, kidneys, and peripheral blood vessels, reducing quality of life, causing mortality, and imposing significant financial burdens on the nation (1).

By 2025, hypertension is anticipated to affect approximately 33 % of the global population, equating to 8 billion individuals, predominantly in low- and middle-income nations, comprising two-thirds of the affected demographic (6). Up to 46 % of individuals with hypertension are oblivious to their condition. The prevalence of uncontrolled hypertension among patients was determined to be 25 %, with nearly half exhibiting

blood pressure readings over 140/90 mmHg (7). The data shows that hypertension affects 90 % of patients at the Pacar Keling Health Center in Surabaya. More than half of these patients (53 %) do not adhere to dietary or medication recommendations. The primary reason for this noncompliance is a perception of health, reported by 64.14 % of patients, whereas 28.52 % demonstrate inconsistent treatment-seeking behavior. Hypertensive patients should practice self-care by adhering to a low-sodium diet, minimizing caffeine and alcohol intake, abstaining from tobacco, managing stress, engaging in regular physical activity, maintaining a healthy weight, and ensuring adherence to their medication regimen (8).

Hypertension often requires long-term, sometimes lifelong, treatment because the condition tends to persist even when symptoms aren't noticeable. Effective management goes beyond medication and depends heavily on consistent self-care. Patients are encouraged to adopt healthier daily habits, including following a balanced diet, reducing sodium intake, increasing physical activity, limiting smoking, and decreasing alcohol consumption. These lifestyle adjustments play a crucial role in controlling blood pressure and preventing complications over time (4). Typically, interventions at health centers include health education and early detection. Nonetheless, numerous individuals with hypertension continue to neglect their dietary regimen, fail to engage in regular physical activity, and exhibit fluctuating blood pressure levels. The objective of attaining normal blood pressure in hypertensive individuals has not been accomplished (9).

The Self-Care of Chronic Illness Theory and the Health Belief Model indicate that patient variables, including age, gender, education, and duration of hypertension, affect health literacy and self-efficacy, thereby influencing self-care behaviors. Self-care practices sustain physiological equilibrium; monitoring facilitates early identification of blood pressure fluctuations; and management ensures appropriate responses to symptoms. These domains collaborate to achieve optimal blood pressure regulation, underscoring the need to enhance patient education and self-efficacy to improve outcomes in hypertension. This study aims to provide critical insights into the self-management practices of patients with hypertension, including monitoring and management strategies, to enhance their motivation to reduce the risk of complications associated with this condition.

This research is important because previous studies on self-care among hypertensive patients in Indonesia have been limited in several key aspects. Most earlier studies focused primarily on knowledge and medication adherence, without thoroughly examining the relationship between self-care behaviors, such as maintenance, monitoring, and management, and blood pressure control. Additionally, many existing studies were descriptive and localized, lacking a comprehensive analysis that integrates demographic variables such as age, education, and illness duration. Therefore, this study fills an important gap by providing empirical evidence on how self-care components relate (or do not relate) to blood pressure levels among Indonesian hypertensive patients, offering a more holistic understanding for future intervention strategies and policy development in hypertension management.

METHODS

This research was performed in J and T Health Centers in Surabaya, Indonesia, from March to July 2025. Simple random sampling was used to select participants from a population of 720 hypertensive individuals. The sample size of 225 respondents was determined using Cochran's method (1977) at a 95 % confidence level and a 5 % margin of error. Data were collected using the Self-Care Hypertension Questionnaire Indonesian Version 3 (SC-HiV3) and direct blood pressure measurements in accordance with WHO norms. Participants aged 18 or older, diagnosed with hypertension, and consenting to participate were included, whereas individuals with severe complications, cognitive impairment, or refusal to participate were excluded from the study. The study's independent variables are self-care, gender, age, duration of illness, and self-care for maintenance, monitoring, and management, whereas the dependent variable is

blood pressure. The instrument employed is the Self-Care Hypertension Inventory, Indonesian Version 3 (SC-HiV3), to evaluate self-care among individuals with hypertension. It comprises 24 items categorized into three primary dimensions: self-care maintenance, assessing how regularly patients perform preventive actions such as taking medication, exercising, following a low-salt diet, and attending medical appointments. Self-care monitoring: Measuring the frequency with which patients monitor their condition, such as blood pressure, symptoms, medication side effects, and physical changes. Self-care management: Assessing patients' ability to respond to rising blood pressure, including actions such as reducing stress, contacting healthcare professionals, or adjusting their lifestyle. The validity test findings indicate a Kaiser–Meyer–Olkin (KMO) score of 0.941, which is statistically significant. The KMO score is a statistic used to assess the suitability of the data for factor analysis. In other words, it indicates whether the variables in the dataset share sufficient common variance to justify grouping them into factors. The study demonstrates exceptional reliability and validity, as evidenced by Cronbach's alphas ranging from 0.899 to 0.937 and ICCs (Intraclass Correlation Coefficients) ranging from 0.775 to 0.780.

Data collection occurred from March to July 2025. Data was conveyed by descriptive statistics, including frequency, percentage, range (minimum-maximum), and standard deviation (SD). Bivariate analysis was utilized to investigate the direct correlation between each independent variable, namely age, gender, education level, duration of hypertension, and self-care dimensions, and blood pressure, without developing a complex prediction model. The Spearman correlation test was used because it is appropriate for ordinal or non-normally distributed data (11).

The research protocol has obtained Ethical Clearance from the Ethics Committee of Polkesbaya with Ethical Clearance Document No. EA/2625/KEPK-Poltekkes_Sby/V/2024. Participants voluntarily participated in the study and signed an Informed Consent (IC) or Post-Explanation Consent (PSP) document.

RESULTS

This study involved 225 people, of whom 182 (81.3 %) were female. Based on Table 1, the average age of the participants was 61.62 years (SD ± 11.246), ranging from 31 to 89 years, with the majority aged over 65 years (44 %). Among participants, 52.0 % had completed junior high school. The most common duration of hypertension was 2 to 5 years (41.8 %), with an average of 4.071 years (SD ±4.379). The largest group of participants worked as housewives (58.7 %). The average systolic and diastolic blood pressure of the study participants was 151.92 (SD ± 21.822) mmHg and 88.48 (SD ± 13.812) mmHg, with the highest percentage of participants (5 %) experiencing stage 2 hypertension. Most hypertensive patients' self-care maintenance was satisfactory in 58.7 % of cases and moderate in 39.1 %. Self-care monitoring for hypertensive patients was satisfactory in 44 % of cases. Self-care management among hypertensive patients was mainly satisfactory at 62.2 %.

As shown in Table 2, the Spearman correlation test indicated no association between gender, age, level of education, duration of hypertension, and blood pressure ($p > 0.05$). The gender variable was not associated with patients' blood pressure ($p=0.736 > \alpha=0.05$). Both male and female hypertensive patients most commonly experience stage 1 hypertension, with 46.7 % and 39.5 %, respectively. The age variable was not associated with blood pressure ($p=0.617 > \alpha=0.05$). Hypertensive patients in all age groups had stage 1 hypertension. Similarly, there was no association between educational level (primary, junior high, or senior high) and blood pressure; most patients across all educational groups had stage 1 hypertension ($p=0.996$, $\alpha=0.05$). The duration of hypertension was not associated with blood pressure ($p=0.317 > \alpha=0.05$). Most patients with hypertension lasting less than or equal to one year and those with hypertension lasting more than 10 years were found to have stage 1 hypertension.

Table 1. Sociodemographic, Self-Care, and Blood Pressure of Patients with Hypertension (n=225).

Variable		f	%
Gender	Male	43	18.7
	Female	182	81.3
Age (in years)	Mean 61.62 (SD± 11.246) years		
	Min-Max (31 - 89) years		
	30 - 44	18	8.0
	45 - 54	42	18.7
	55 - 64	66	29.3
	≥65	99	44
Education Level	Elementary School	69	30.7
	Junior High School	117	52.0
	Senior High School	39	17.3
Work	unemployment	23	10.2
	Homemaker	132	58.7
	Private employee	46	20.4
	Entrepreneur	16	7.1
	Civil servant/Pensioner	8	3.6
Duration of hypertension	Mean 4.071 (SD±4.379) years		
	Min-Max (0.2 -25) years		
	≤ 1	78	34.7
	2 – 5	94	41.8
	6 – 10	39	17.3
	>10	14	6.2
Blood Pressure	Systolic Blood Pressure		
	Mean 151.92 (SD± 21.822) mmHg		
	Diastolic Blood Pressure		
	Mean 88.48 (SD ± 13.812) mmHg		
	Optimal	8	3.6
	Normal	3	1.3
	High normal	27	12.0
	Stage 1 hypertension	102	45.3
	Stage 2 hypertension	55	24.4
	Stage 3 hypertension	30	13.3
Self-Care Maintenance of Hypertension	Satisfactory	132	58.7
	Moderate	88	39.1
	Poor	5	2.2
Self-Care Monitoring of Hypertension	Satisfactory	104	46.2
	Moderate	99	44.0
	Poor	22	9.8
Self-Care Management of Hypertension	Satisfactory	140	62.2
	Moderate	77	34.2
	Poor	8	3.6

DISCUSSION

The study's demographic statistics provide substantial insights into the traits of the hypertensive population analyzed. Most participants were elderly, primarily over 65 years, consistent with current evidence that indicates an increased prevalence of hypertension with age and greater comorbidity rates among seniors (10). The participants' educational backgrounds, primarily junior high school, suggest a potential area for targeted assistance. Prior studies emphasize the relationship between educational attainment and hypertension management, suggesting that reduced educational levels may impede

Table 2. Relationship between Blood Pressure and Characteristics and Self-Care of Hypertensive Patients (n=225).

Variable		Blood Pressure												Total		p
		Optimal		Normal		High-normal		Hypertension Stage-1		Hypertension Stage-2		Hypertension Stage-3				
Gender	Male	3	7.0	0	0.0	5	11.6	17	39.5	11	25.6	7	16.3	43	100	0.736
	Female	5	2.7	3	1.6	22	12.1	85	46.7	44	24.2	23	12.6	182	100	
Age (in years)	30 - 44	0	0.0	0	0.0	1	5.6	13	72.2	4	22.4	0	0.0	18	100	0.617
	45 - 54	0	0.0	0	0.0	1	2.4	19	45.2	15	35.7	7	16.7	42	100	
	55 - 64	6	9.1	1	1.5	13	19.7	23	34.8	17	25.8	6	9.1	66	100	
	≥65	2	2.0	2	2.0	12	12.1	47	47.5	19	19.2	17	17.2	99	100.0	
Level of Education	Primary School	1	1.4	1	1.4	8	11.6	32	46.4	15	21.7	12	17.4	69	100	0.996
	Secondary School	7	6.0	2	1.7	17	14.5	48	41.0	31	26.5	12	10.3	117	100	
	High School	0	0.0	0	0.0	2	5.1	22	56.4	9	23.1	6	15.4	39	100	
Duration of hypertension	≤ 1	1	1.3	0	0.0	5	6.4	53	67.9	12	15.4	7	9.0	78	100.0	0.317
	2 – 5	6	6.3	1	1.0	14	14.6	32	33.3	29	30.2	14	14.6	96	100	
	6 – 10	1	2.6	1	2.6	7	17.9	12	30.8	11	28.2	7	17.9	39	100	
	>10	0	0.0	1	8.3	1	8.3	5	41.7	3	25.0	2	16.7	12	100	
Self-Care Maintenance	Good	7	5.3	3	2.3	19	14.4	60	45.5	26	19.7	17	12.9	132	100	0.405
	Moderate	1	1.1	0	0.0	7	8.0	40	45.5	28	31.8	12	13.6	88	100	
	Poor	0	0	0	0	1	20.0	2	40.0	1	20.0	1	20.0	5	100	
Self-Care Monitoring	Good	4	3.8	2	1.9	12	11.5	55	52.9	17	16.3	14	13.5	104	100	0.392
	Moderate	4	4.0	1	1.0	11	11.1	39	39.4	30	30.3	14	14.1	99	100	
	Poor	0		0		4		8	36.4	8	36.4	2	9.1	22	100	
Self-Care Management	Good	8	5.7	3	2.1	19	13.6	65	46.4	27	19.3	18	12.9	140	100	0.294
	Moderate	0	0.0	0	0.0	7	9.1	34	44.2	25	32.5	22	14.3	77	100	
	Poor	0	0.0	0	0.0	1	12.5	3	37.5	3	37.5	1	12.5	8	100	

effective self-management among hypertensive individuals (11-13). Consequently, these findings underscore the need for educational programs tailored to diverse educational levels to improve health literacy and enable older adults to manage hypertension (14-16).

The duration of hypertension among participants suggested that a significant proportion had been diagnosed between 2 and 5 years, demonstrating a relatively recent development of the illness for this group. Research indicates that early management in the years following a hypertension diagnosis may markedly improve long-term outcomes (17). Proactive management measures during these critical years can avert advancement to more severe stages of hypertension, which is essential considering that the study identified 5 % of individuals with stage 2 hypertension—a condition necessitating immediate clinical intervention (10). Healthcare practitioners should enhance monitoring and expand educational initiatives on lifestyle adjustments during the initial management phase of hypertension, as recommended by public health guidelines (17).

The subjects demonstrated increased blood pressure, with mean systolic and diastolic values of 151.92 mmHg and 88.48 mmHg, respectively. These data align with reports indicating the concerning trend of elevated systolic and diastolic pressures in aging persons, hence increasing the risk of cardiovascular disease (18). Results highlight that controlling systolic pressure is especially vital for older persons, as it is linked to morbidity and mortality outcomes related to cardiovascular diseases (19). Implementing strategies such as the Dietary Approaches to Stop Hypertension (DASH), which focuses on foods that support healthy blood pressure. It emphasizes plenty of fruits, vegetables, whole grains, lean proteins, and low-fat dairy. At the same time, it limits foods high in saturated fat, cholesterol,

added sugars, and especially sodium. The overall goal is to create a nutrient-dense pattern rich in potassium, calcium, magnesium, and fiber—all of which help regulate blood pressure. This pattern has demonstrated efficacy in reducing both systolic and diastolic blood pressure and may be advantageous for this group (20). Moreover, increased physical activity and lifestyle modifications have been advocated as effective strategies for reducing blood pressure in older adults (21).

The occupational distribution of participants, notably the substantial proportion of housewives, prompts critical inquiry into socioeconomic status and its influence on healthcare accessibility and health outcomes. Numerous studies have associated occupation with hypertension risk factors, such as stress levels and physical exercise; the prevalence of housewives may indicate constraints in social support networks and economic autonomy (11). Understanding the intricate relationships between professional roles and health may inform the development of tailored treatments to improve health outcomes for women, particularly in contexts where conventional gender roles restrict health-related decision-making (11). Furthermore, educational initiatives that integrate family dynamics and foster household support may improve self-management strategies among patients with hypertension (22).

This study provides significant insights into the demographic traits and hypertension profiles of an elderly population. It underscores the need for specialized health education and intervention initiatives that account for sociodemographic variables, including age, education, and employment status. There is a pressing need for community-oriented approaches that incorporate health literacy and self-management skills, especially among older adults with hypertension, to enhance treatment adherence and ultimately alleviate the burden of cardiovascular diseases in this at-risk population (23). Future research should prioritize longitudinal studies to assess the effectiveness of diverse interventions designed for this demographic's specific difficulties and requirements.

The Spearman correlation study indicates no significant associations between demographic factors, specifically gender, age, educational attainment, and duration of hypertension, and blood pressure levels in hypertensive patients. The p-values for each variable (gender: $p=0.736$; age: $p=0.617$; education level: $p=0.996$; duration of hypertension: $p=0.317$) indicate that none of these factors meet the criterion for statistical significance ($p>\alpha=0.05$). The absence of a correlation between demographic characteristics and blood pressure levels is consistent with other research indicating heterogeneous effects of demographic parameters on hypertension prevalence (24). The findings are consistent with several studies indicating that gender differences do not substantially affect hypertension outcomes in large cohorts. This suggests that behavioral factors may have a greater influence on blood pressure regulation than demographic factors (23). Furthermore, evidence concerning the older demographic has shown that although age is associated with the incidence of hypertension, it does not inherently correspond with blood pressure levels in individuals already diagnosed with the condition (25).

The lack of a significant correlation between patient characteristics and blood pressure may be attributed to methodological and contextual factors. The sample was relatively homogeneous, with most participants classified as having grade 1 hypertension and demonstrating moderate-to-good self-care, which limited variability and reduced statistical power (26). Most respondents were middle-aged and had lived with hypertension for several years, suggesting adaptation to treatment through consistent medication use and regular monitoring, which may have stabilized their blood pressure and minimized demographic differences (27). Moreover, unmeasured behavioral and environmental factors—such as sodium intake, psychological stress, physical activity, and social support, may have played a stronger role in influencing blood pressure than demographic characteristics (28). The exclusion of these potential confounders could explain the absence of significant findings. These results indicate that demographic factors alone may not adequately predict variation in blood pressure among hypertensive patients. Future research employing longitudinal or mixed-methods designs is recommended to examine how biological, behavioral, and psychosocial factors

interact over time to influence hypertension control and self-care effectiveness.

CONCLUSION

Demographic characteristics, including gender, age, education level, and duration of hypertension, do not show a significant correlation with blood pressure levels in hypertensive patients. Spearman's correlation analysis yielded a p-value above the statistical significance threshold, indicating that these demographics did not significantly influence hypertension severity. A significant majority of patients across all demographic categories were classified as having Stage 1 hypertension, indicating consistency in the seriousness of hypertension regardless of these characteristics.

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Disclaimer

No Disclaimer

Conflict of interest

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