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Associations of physical activity with quality of life and sleep quality among adults with hypertension in primary care

Iba Supra Saba^{1*}, Sumbara²

¹Program Studi DIII Keperawatan, Politeknik Karya Husada

²Program Studi S1 Keperawatan Ners, Universitas Bhakti Kencana

Corresponding author: *E-mail: ibasuprasaba9@gmail.com

Abstract

Background: Hypertension is a major public health problem that negatively affects patients' quality of life and sleep quality. Physical activity is an important non-pharmacological strategy that may improve both outcomes; however, evidence from primary healthcare settings remains limited.

Purpose: To examine the relationship between physical activity, quality of life, and sleep quality among patients with hypertension.

Method: This analytical correlational study employed a cross-sectional design involving 84 hypertensive patients selected from a population of 352 registered at Singajaya Public Health Center. Data were collected using a respondent characteristics questionnaire, the Global Physical Activity Questionnaire (GPAQ), the World Health Organization Quality of Life-BREF (WHOQOL-BREF), and the Pittsburgh Sleep Quality Index (PSQI). Descriptive statistics and Spearman's rank correlation test were used for data analysis, with a significance level of 0.05.

Results: Most participants had low physical activity (38.1%), good quality of life (54.8%), and poor sleep quality (52.4%). Physical activity was positively correlated with quality of life ($\rho = 0.721$, $p < 0.001$) and negatively correlated with PSQI scores ($\rho = -0.628$, $p < 0.001$), indicating that higher physical activity was associated with better quality of life and better sleep quality.

Conclusion: Higher levels of physical activity were significantly associated with better quality of life and sleep quality among patients with hypertension. These findings support the importance of promoting physical activity as part of hypertension management in primary healthcare settings.

Keywords: Hypertension; Physical Activity; Quality of Life; Sleep Quality; Primary Healthcare.

INTRODUCTION

Hypertension remains one of the leading non-communicable diseases (NCDs) and a major public health concern worldwide because of its high prevalence and its association with cardiovascular disease, stroke, kidney failure, and premature mortality. Approximately 1.4 billion adults aged 30–79 years were living with hypertension in 2024, representing about one-third of the global population in this age group (World Health Organization, 2025). Two-thirds of these individuals reside in low- and middle-income countries. Furthermore, approximately 44% of people with hypertension

remain undiagnosed, and only 23% achieve adequate blood pressure control, highlighting the continuing challenge of hypertension management worldwide. Hypertension also represents a major health problem in Indonesia. The Indonesian Health Survey (IHS) 2023 reported hypertension as the fourth leading risk factor for mortality, contributing to 10.2% of all deaths, and the leading cause of disability related to non-communicable diseases among individuals aged ≥ 15 years. Insufficient physical activity is one of the most important modifiable risk factors, with adults aged 18–59 years who are physically inactive having a 1.9-fold

higher proportion of hypertension than those who engage in sufficient physical activity (Ministry of Health of the Republic of Indonesia, 2024). Consequently, the Indonesian Ministry of Health recommends at least 150 minutes of moderate-intensity physical activity per week as part of lifestyle modification to control blood pressure and reduce cardiovascular risk (Ministry of Health of the Republic of Indonesia, 2025).

At the regional level, hypertension continues to impose a substantial burden on health services in Garut Regency. Data from the West Java Provincial Health Office recorded 117.271 hypertensive patients receiving healthcare services in 2024, increasing to 117.407 in 2025 (West Java Provincial Health Office, 2025). A similar trend was observed at Singajaya Public Health Center, where the number of registered hypertensive patients increased from 340 cases in 2024 to 692 cases in 2025. By June 2026, 352 patients had already been recorded, exceeding the total number of cases reported throughout 2024. These findings indicate that hypertension remains a major chronic disease requiring effective management through the modification of controllable risk factors. Regular physical activity is a key component of hypertension management. It improves cardiovascular function, enhances vascular elasticity, increases insulin sensitivity, assists in weight control, and reduces sympathetic nervous system activity, thereby contributing to blood pressure reduction. In addition to its physiological benefits, physical activity promotes endorphin release, improves psychological well-being, and enhances functional capacity, which may ultimately improve patients' quality of life (Zhu, Yan, Wang, Hu, Zhu, & Chen, 2021).

Hypertension affects not only blood pressure but also patients' quality of life and sleep quality. Uncontrolled hypertension may lead to fatigue, emotional distress, reduced functional capacity, and limitations in daily activities, all of which contribute to poorer quality of life. Sleep disturbances are also common among patients with hypertension because of sympathetic nervous system activation, hormonal changes, and anxiety related to the disease. Poor sleep quality may further impair blood pressure regulation by increasing cortisol levels, whereas regular physical activity has been shown to improve sleep quality through enhanced relaxation,

neuroendocrine regulation, and stress reduction (Wan-Fei, Hassan, & Latiff, 2017). Previous studies have demonstrated significant associations between physical activity and both quality of life and sleep quality among patients with hypertension. Regular physical activities, such as hypertension exercise, brisk walking, and walking, were associated with improved quality of life, particularly in the physical domain (Xu, Rao, Shi, Liu, Chen, & Zhao, 2016). A significant relationship between physical activity and sleep quality among hypertensive patients at Kaliwates Public Health Center ($p = 0.041$), indicating that regular physical activity contributes to better sleep quality (Yan, Gao, Sun, & Wang, 2024). Despite these findings, previous studies have generally examined the relationship between physical activity and quality of life or sleep quality separately. Evidence evaluating the associations of physical activity with both outcomes simultaneously among hypertensive patients in primary healthcare settings remains limited, particularly in Garut Regency.

RESEARCH METHOD

An analytical correlational design with a cross-sectional approach. The study population comprised 352 patients with hypertension who received treatment at Singajaya Public Health Center, Garut Regency, between January and June 2026. A total of 84 participants were recruited based on a sample size calculated using G*Power. The inclusion criteria were patients diagnosed with hypertension by a healthcare professional with a blood pressure of $>140/90$ mmHg. Patients with severe illness or acute complications that prevented participation were excluded.

Data were collected using a respondent characteristics questionnaire, the Global Physical Activity Questionnaire (GPAQ) to assess physical activity, the World Health Organization Quality of Life-BREF (WHOQOL-BREF) to measure quality of life, and the Pittsburgh Sleep Quality Index (PSQI) to evaluate sleep quality. Descriptive statistics were used to summarize respondents' characteristics and study variables. The relationships between physical activity and quality of life, as well as between physical activity and sleep quality, were analysed using Spearman's rank correlation test because the variables were measured on an ordinal scale. Statistical analyses were performed using a 95% confidence level with a significance threshold of $p < 0.05$.

Iba Supra Saba^{1*}, Sumbara²

¹Program Studi DIII Keperawatan, Politeknik Karya Husada

²Program Studi S1 Keperawatan Ners, Universitas Bhakti Kencana

Corresponding author: *E-mail: Ibasuprasaba9@gmail.com

RESEARCH RESULTS

Table 1. characteristics of the Participants (N = 84)

Variable	Results
Age (Mean±SD)(Range)(Year)	(53.9±11.6)(35–75)
Duration of hypertension (Mean±SD)(Range)(Year)	(5.51± 2.77)(1–10)
Gender (n/%)	
Male	41/48.8
Female	43/51.2
Education (n/%)	
Elementary School	17/20.2
Junior High School	38/45.2
Senior High School	19/22.6
University	10/11.9
Occupation (n/%)	
Employed	42/50.0
Unemployed	42/50.0
Physical activity (GPAQ) (n/%) (Mean±SD)	(93.7± 5.55)
Low	32/38.1
Moderate	31/36.9
High	21/25.0
Quality of life (WHOQOL) (n/%) (Mean±SD)	(59.7± 11.7)
Good	46/54.8
Poor	38/45.2
Sleep quality (PSQI) (n/%) (Mean±SD)	(6.90 ± 3.26)
Good	40/47.6
Poor	44/52.4

Table 1 presents the demographic and clinical characteristics of the participants. The mean age was 53.9 ± 11.6 years, and the mean duration of hypertension was 5.51 ± 2.77 years. Most participants were female (51.2%), had completed junior high school (45.2%), and were equally distributed between employed and unemployed status (50.0% each). Regarding the study variables, most participants had low physical activity (38.1%), good quality of life (54.8%), and poor sleep quality (52.4%).

Table 2. Spearman's Rank Correlation Matrix Among Study Variables

Variable	MET-min (GPAQ)	Score WHOQOL	Score PSQI
MET-min (GPAQ)	—	—	—
Score WHOQOL	0,721***	—	—
Score PSQI	-0,628***	-0,588***	—

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²Program Studi S1 Keperawatan Ners, Universitas Bhakti Kencana

Corresponding author: *E-mail: Ibasuprasaba9@gmail.com

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Table 2 presents the correlations among physical activity, quality of life, and sleep quality. Spearman's rank correlation analysis showed a strong positive correlation between physical activity and quality of life ($\rho = 0.721$, $p < 0.001$), indicating that higher levels of physical activity were associated with better quality of life. Physical activity was also significantly and negatively correlated with PSQI scores ($\rho = -0.628$, $p < 0.001$). Because lower PSQI scores indicate better sleep quality, this finding suggests that higher physical activity was associated with better sleep quality. In addition, quality of life was negatively correlated with PSQI scores ($\rho = -0.588$, $p < 0.001$), indicating that participants with better quality of life tended to have better sleep quality.

DISCUSSION

The present study found that most participants were female (51.2%) with a mean age of 53.9 years. This finding is consistent with previous evidence indicating that the prevalence of hypertension increases among middle-aged and older women because declining estrogen levels during the menopausal transition reduce vascular protection, leading to endothelial dysfunction, increased arterial stiffness, and elevated blood pressure (Hoseini, Hoseini, & Rahmani, 2025; Chokroverty, 2017). The mean duration of hypertension was 5.51 years, suggesting that most participants had experienced a chronic condition requiring long-term self-management to prevent cardiovascular complications (Son, Park, & Won, 2018).

This study demonstrated a significant and strong positive correlation between physical activity and quality of life among patients with hypertension ($\rho = 0.721$, $p < 0.001$). These findings indicate that individuals with higher levels of physical activity tended to report better quality of life. Regular physical activity improves cardiovascular function, enhances endothelial nitric oxide production, reduces peripheral vascular resistance, and contributes to better blood pressure control, thereby alleviating physical symptoms and improving daily functioning (Léle, Nenoh, Ndongo, Ebongue, Kengni, Mouliom, & Kamdem, 2025). These physiological benefits are accompanied by psychological improvements through increased endorphin release, which enhances emotional well-being and overall life

satisfaction. Similar findings have been reported in previous studies showing that regular walking and aerobic exercise significantly improve both physical and psychological domains of quality of life among patients with hypertension (Rachmawati, Novindra, Syarifah, & Aisy, 2024).

A significant negative correlation was also observed between physical activity and PSQI scores ($\rho = -0.628$, $p < 0.001$), indicating that greater physical activity was associated with better sleep quality. Regular physical activity serves as an important regulator of circadian rhythm by facilitating physiological processes that promote sleep initiation and maintenance, including reductions in sympathetic nervous system activity and improved neuroendocrine regulation (Lau, Ching, & Fatimah, 2025). Improved sleep quality among physically active individuals has also been demonstrated in previous studies, which reported shorter sleep latency, fewer nocturnal awakenings, and greater sleep satisfaction among hypertensive patients who routinely engaged in physical activity (Li, Ching, Liong, Lau, & Fatimah, 2026; Sang, Kang, Liao, Wu, Hu, Liu, & Zhang, 2021).

The study further identified a significant negative correlation between quality of life and PSQI scores ($\rho = -0.588$, $p < 0.001$), indicating that better quality of life was associated with better sleep quality. Sleep disturbances may impair physical recovery, emotional stability, and functional capacity, thereby reducing overall well-being among individuals with chronic diseases. Conversely, adequate sleep contributes to improved physical functioning, emotional health, and daily activities, ultimately enhancing quality of life (Smith, Sherwood, Avorgbedor, Ingle, Kraus, Hinderliter, & Blumenthal, 2023; Chen, Ran, Li, & Tan, 2021). These findings suggest that quality of life and sleep quality are closely interconnected and should be considered together in hypertension management (Ayanaw, Temesgen, Azagew, & Ferede, 2022).

The findings have important implications for nursing practice in primary healthcare settings. Nurses should routinely assess physical activity, quality of life, and sleep quality as part of comprehensive hypertension management and provide structured education regarding lifestyle modification. Physical activity-based nursing

Iba Supra Saba^{1*}, Sumbara²

¹Program Studi DIII Keperawatan, Politeknik Karya Husada

²Program Studi S1 Keperawatan Ners, Universitas Bhakti Kencana

Corresponding author: *E-mail: Ibasuprasaba9@gmail.com

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interventions, such as regular walking programs, low-impact aerobic exercise, and individualized exercise counselling, may serve as effective non-pharmacological strategies to improve quality of life and sleep quality while supporting blood pressure control. Integrating these interventions into community-based hypertension management programs may contribute to more holistic, patient-centered care and improved long-term health outcomes (Bibbiso, Berkessa, Issaaga, Abdu, & Zewdie, 2026).

CONCLUSION

The majority of patients with hypertension had low levels of physical activity, good quality of life, and poor sleep quality. Physical activity was positively associated with quality of life ($p = 0.721$, $p < 0.001$) and negatively associated with PSQI scores ($p = -0.628$, $p < 0.001$), indicating that higher levels of physical activity were associated with better quality of life and better sleep quality. These findings highlight the importance of promoting regular physical activity as part of comprehensive hypertension management to improve patients' overall well-being in primary healthcare settings.

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Iba Supra Saba^{1*}, Sumbara²

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