

The Relationship Between Hypertension and Sleep Quality Among the Elderly at the UPT PSTW Jember

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ABSTRACT

Introduction: The aging process leads to a decline in bodily functions and a weakened immune system, making older adults more susceptible to conditions such as hypertension. High blood pressure in older adults can also trigger sleep disturbances that reduce sleep quality. This study was conducted to analyze the relationship between blood pressure and sleep quality in older adults with hypertension.

Method: This study used a correlational cross-sectional design. The population consisted of 59 elderly individuals, and 51 of them were sampled using purposive sampling. Data collection was conducted using blood pressure observation sheets and the Pittsburgh Sleep Quality Index (PSQI) questionnaire. The statistical test used was Spearman's correlation.

Result: The results of the study indicate that the majority of older adults do not have hypertension (66.7%) and experience poor sleep quality (62.7%). The Spearman's correlation test yielded a p-value of 0.041 ($p < 0.05$) with a correlation coefficient of $r = 0.287$, indicating a moderate association between blood pressure in older adults with hypertension and sleep quality.

Conclusion: There is a correlation between the incidence of hypertension and sleep quality among the elderly at the UPT PSTW Jember.

Keywords: *Sleep Quality; Elderly; Hypertension*

Introduction

Older adults are defined as individuals over the age of 60 who experience changes in various aspects, such as physical, mental, and social (Yusmaida & Zulkarnaini, 2024). In line with this view, Rusdi (2024) emphasizes that the aging process leads to a decline in organ function, which weakens the immune system and makes older adults more susceptible to various diseases such as stroke, kidney disorders, cancer, diabetes, heart disease, and hypertension.

Hypertension is defined as a chronic elevation in blood pressure that is commonly experienced by the elderly population and has the potential to cause complications if not properly managed. Hypertension is defined as a systolic blood pressure of ≥ 140 mmHg and a diastolic blood pressure of ≥ 90 mmHg (Wirakhmi, 2023).

The World Health Organization (WHO) reports that 26.4% of older adults worldwide have hypertension, with Southeast Asia ranking second globally with a prevalence rate of 25%. A study conducted by Anita & Indrawati (2024) based on the 2023 Indonesian Health Survey (SKI) found that the prevalence of hypertension was 34.1%. Meanwhile, according to research by Munawaroh & Astuti (2024), East Java ranks fourth with the highest hypertension rate at 34.3%, while in Jember Regency, the prevalence of hypertension stands at 31.7% of the elderly population and is projected to rise to 42% by 2025 if not properly managed.

The results of a preliminary study at the Jember PSTW Technical Implementation Unit (UPT), based on interviews with nurses, showed that there were 140 older adults, 59 of whom had hypertension. Blood pressure measurements indicated that 42% of the older adults had hypertension. In addition, the majority of older adults complained of sleep disturbances, characterized by frequent activity in the early morning hours. Further analysis revealed that 75% of the elderly had difficulty falling asleep, 33.3% slept only about 5 hours per day, 66.7% had good sleep efficiency, 75% experienced sleep disturbances, 91.7% did not use sleep medication, 41.7% experienced daytime sleepiness, and 58.3% rated their sleep quality as poor.

Sleep quality is a major issue frequently experienced by older adults (Nazmi et al., 2024). Utami et al. (2021) explain that sleep quality is defined as a subjective measure of the level of satisfaction and comfort felt regarding one's sleep experience, without the presence of symptoms of sleep deprivation or disturbances during sleep. Leba et al. (2023) identify factors that can influence sleep quality in older adults, including responses to illness, lifestyle, and psychological stress. Healthy older adults typically experience restful and sound sleep, whereas those with health conditions may have unmet sleep needs due to their medical circumstances.

One health condition that can affect sleep quality is hypertension. Older adults with hypertension tend to experience sleep disturbances due to unstable blood pressure and the

side effects of antihypertensive medications. Symptoms such as dizziness, stiffness in the neck, discomfort, shortness of breath, and nocturia associated with uncontrolled hypertension can disrupt sleep. This occurs due to increased activity in the Reticular Activating System (RAS) and the sympathetic nervous system, which triggers the release of cortisol and catecholamines, leading to vasoconstriction and an increased heart rate. Consequently, the relaxation process necessary for falling asleep is disrupted, resulting in reduced sleep continuity, duration, depth, and satisfaction (Zidan & Subekti, 2023b); (Galindra et al., 2024).

This description forms the basis of the researchers' interest in investigating the relationship between hypertension and sleep quality among older adults at the UPT PSTW Jember. This study aims to analyze the relationship between five hypertension-related factors and sleep quality in older adults, with the hope of broadening our understanding of the various factors that contribute to sleep quality in this population.

Method

This study employed a quantitative correlational research design with a cross-sectional approach to examine the relationship between hypertension and sleep quality among older adults at UPT Pelayanan Sosial Tresna Werdha (PSTW) Jember. The population consisted of 59 elderly individuals diagnosed with hypertension, and a sample of 51 respondents was selected using a non-probability purposive sampling technique based on predetermined inclusion and exclusion criteria. Data were collected using a digital sphygmomanometer and a blood pressure measurement sheet to assess hypertension status, as well as the Pittsburgh Sleep Quality Index (PSQI) questionnaire to measure sleep quality. The PSQI instrument had been tested and demonstrated good reliability with a Cronbach's alpha value of 0.702.

Data collection procedures included obtaining administrative and ethical approvals, coordinating with the institution, selecting eligible participants, obtaining informed consent, measuring blood pressure, administering questionnaires, and ensuring the confidentiality of participant information. Data were analyzed using SPSS version 21 through univariate and bivariate analyses. The relationship between hypertension and sleep quality was examined using the Spearman rank correlation test. This study received

ethical approval from the Health Research Ethics Committee (KEPK) of the Faculty of Health Sciences, Universitas Muhammadiyah Jember, with ethical clearance number 0015/KEPK/FIKES/XII/2025.

Results

The research data were presented in two sections: general data and specific data. General data included respondent characteristics such as age, gender, exercise habits, consumption of salty foods, and smoking habits. Specific data consisted of blood pressure status and sleep quality among elderly individuals with hypertension at UPT Pelayanan Sosial Tresna Werdha (PSTW) Jember. Furthermore, specific data also presented the results of the analysis examining the relationship between hypertension and sleep quality among the elderly using the Spearman correlation test.

Table 1. 1 Distribution of Characteristics of Elderly Respondents at the UPT PSTW Jember, March 2026, (n = 51)

Chatacteristics	Indicator	Frequency	Percentage (%)
Gender	Male	20	39,2
	Female	31	60,8
Age	60 – 74 years	31	60,8
	75 – 90 years	20	39,2
	>90 years	0	0
exercise	Yes	38	74,5
	No	13	25,5
Consumption of salty foods	Likes	35	68,8
	Dislikes	16	31,4
Smoking	Yes	14	27,5
	No	37	72,5

Source: Primary Data, 2026

Based on the respondents' characteristics, the majority of respondents were female (60.8%). Regarding age, most respondents were aged 60–74 years (60.8%). In terms of exercise habits, the majority regularly participated in elderly exercise programs (74.5%). Regarding the consumption of salty foods, most respondents reported liking salty foods (68.8%). Furthermore, the majority of respondents were non-smokers (72.5%).

Table 1. 2 Frequency Distribution of Hypertension Cases Among the Elderly at the UPT PSTW Jember, March 2026 (n = 51)

Hypertension	Frequency	Percentage (%)
Yes	17	33,3
No	34	66,7
Total	51	100,0

Source: Data Primary, 2026

Table 1.2 shows that the majority of older adults do not have hypertension, namely 34 respondents (66.7%).

Table 1. 3 Frequency Distribution of Sleep Quality Among the Elderly at the UPT PSTW Jember, March 2026, (n = 51)

Sleep Quality	Frequency	Percentage (%)
Good	19	37,3
Bad	32	62,7
Total	51	100,0

Source: Data Primary, 2026

Table 1.3 shows that the majority of older adults have poor sleep quality, namely 32 respondents (62.7%).

Table 1. 4 The Relationship Between Hypertension and Sleep Quality Among Older Adults at the UPT PSTW Jember, March 2026 (n = 51)

Sleep Quality								
Hypertension	Sleep Quality Good		Sleep Quality Bad		Total		<i>p value</i>	<i>r</i>
	n	%	n	%	n	%		
Yes	3	5,9	14	27,5	17	33,3	0,041	0,287
No	16	31,4	18	35,3	34	66,7		
Total	19	37,3	32	62,7	51	100,0		

Source: Data Primary, 2026

The results of the Spearman's rho statistical test showed a p-value of 0.041 ($p < 0.05$), indicating a significant association between the prevalence of hypertension and sleep quality among older adults at the UPT PSTW Jember. The correlation coefficient (r) = 0.287 indicates that the relationship between blood pressure and sleep quality falls into the category of moderate strength with a positive direction, meaning that the higher the blood pressure of the elderly, the worse their sleep quality will be. Thus, the

alternative hypothesis (H1) is accepted, meaning there is a relationship between the incidence of hypertension and sleep quality among the elderly at the UPT PSTW Jember.

Discussion

The results of this study indicate a relationship between the prevalence of hypertension and sleep quality among older adults at the UPT PSTW Jember. These findings are consistent with the study by Zidan & Subekti (2023), which states that older adults with hypertension are at risk of sleep disturbances, making hypertension an important factor influencing sleep quality in this age group.

In general, older adults with hypertension tend to experience sleep disturbances, leading to a decline in sleep quality. This condition becomes even more complex because the aging process itself causes physiological changes in sleep patterns. As people age, there is a decrease in sleep duration, an increase in sleep latency (the time it takes to fall asleep), and a decrease in sleep efficiency. Older adults also wake up more frequently at night or in the early morning, including to urinate (nocturia), and are more sensitive to environmental disturbances such as noise, lighting, and room temperature (Hakim et al., 2022).

The aging process leads to a decrease in NREM sleep stages 3 and 4—the deep sleep stages that serve to facilitate physical and mental recovery. This reduction in sleep stages results in an increased frequency of waking during the night among older adults, as well as difficulty in maintaining sleep continuity after waking (Manulang et al., 2024). Haryati et al. (2022) state that the reduction in NREM stages 3 and 4 causes older adults to experience sleep fragmentation, which ultimately lowers overall sleep quality. As a result, older adults often experience changes in their sleep patterns, such as going to sleep earlier but waking up earlier, as well as needing naps to make up for a lack of nighttime sleep. These changes in sleep patterns impact the quality of life of older adults. If their sleep needs are adequately met, older adults will have sufficient energy for daily activities, better concentration, and a more stable emotional state. Conversely, if sleep quality is not met, it will lead to a decline in cognitive function, physical fatigue, and mood disturbances (Basarewan et al., 2022).

Sleep disturbances in older adults with hypertension are also influenced by symptoms resulting from uncontrolled blood pressure, such as dizziness, neck stiffness, discomfort, difficulty breathing, and nocturia. These symptoms can hinder the process of falling asleep and increase the frequency of nighttime awakenings, thereby disrupting sleep continuity and reducing sleep quality (Marni et al., 2021).

Physiologically, sleep disturbances in older adults with hypertension are associated with the activity of the sleep control center, or Reticular Activating System (RAS). This system regulates the body's sleep-wake cycle. In cases of high blood pressure, the RAS receives numerous afferent stimuli from the periphery, leading to increased sympathetic nervous system activity. This increased activity triggers the release of stress hormones namely cortisol and catecholamines which cause vasoconstriction of blood vessels and tachycardia. Excessive sympathetic activity inhibits the relaxation necessary to initiate sleep, thereby causing older adults with hypertension to experience disturbances in sleep continuity, duration, depth, and satisfaction, which ultimately reduce sleep quality (Zidan & Subekti, 2023); (Galindra et al., 2024).

The findings of this study can be analyzed using Sister Callista Roy's Adaptation Model, which views older adults as adaptive systems that respond to internal and external stimuli. Hypertension serves as the focal stimulus because it causes physical symptoms such as headaches, palpitations, and nocturia, which disrupt sleep. Contextual stimuli include advanced age, postmenopausal status, lack of physical activity, excessive salt intake, and exposure to secondhand smoke, all of which contribute to elevated blood pressure. Meanwhile, residual stimuli encompass environmental changes in the nursing home, limited social roles, and daily activity patterns dictated by the facility's rules.

These stimuli are processed through regulatory and cognitive coping mechanisms. Physiologically, hypertension activates the sympathetic nervous system and increases cortisol levels, which inhibit relaxation and melatonin production, thereby disrupting sleep. The study findings indicate that the majority of older adults with hypertension experience poor sleep quality, suggesting that the adaptation process at the Jember UPT PSTW is not yet optimal. Unstable blood pressure and decreased sleep quality influence each other; thus, according to Roy's Adaptation Theory, this condition represents an adaptive response that tends to be ineffective.

This situation has the potential to cause long-term effects if not addressed comprehensively. Potential risks include an increase in the incidence of hypertension, cognitive impairment, immune system deficiency, prolonged fatigue, and an increased risk of falls due to weakness, as well as an overall decline in the quality of life for older adults

Conclusion

The majority of older adults at the Jember PSTW UPT do not have hypertension. Meanwhile, the majority of older adults at the Jember PSTW UPT have poor sleep quality. The study results also indicate that there is a relationship between the prevalence of hypertension and sleep quality among older adults at the Jember PSTW UPT, suggesting that these two variables are interrelated.

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