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RELATIONSHIP SLEEP DURATION AND SLEEP QUALITY WITH BLOOD PRESSURE IN HYPERTENSION PATIENTS

Rahmawati Wahyudin[1*], Rian Tasalim[2], Muhammad Sandi Suwardi[3], Onieqie Ayu Dhea Manto[1]

[1]Undergraduate Nursing Program, Faculty of Health, Universitas Sari Mulia, Banjarmasin, Indonesia
[2]Professional Nursing Program, Faculty of Health, Universitas Sari Mulia, Banjarmasin, Indonesia
[3]Ulin Regional General Hospital, Banjarmasin, Indonesia
Corresponding Author: rahmawahyu197@gmail.com

ABSTRACT

Background: That approximately 1.13 billion people worldwide suffer from hypertension, with more than half of them being over the age of 60. Each year, between 20% and 50% of the elderly population report experiencing sleep problems, and around 17% suffer from serious sleep disorders. Sleep quality and duration are among the factors that can influence blood pressure in older adults. **Objective**: To determine the relationship between sleep duration and sleep quality with blood pressure in elderly individuals with hypertension. **Method:** This study is a quantitative research using a cross-sectional design. The sample consisted of 95 participants selected through purposive sampling. The data collection instrument used in this study was the Pittsburgh Sleep Quality Index (PSQI) questionnaire. Data were analyzed using univariate analysis through frequency distribution and bivariate analysis using the Spearman Rank Correlation Test. **Results**: The findings revealed a significance value (Sig. 2-tailed) of 0.000, which is lower than the p-value threshold (0.000 < 0.05). This indicates a significant and strong correlation between sleep duration and sleep quality with blood pressure among the elderly in the service area of Pekauman Public Health Center. **Conclusion:** Short sleep duration and poor sleep quality have an impact on blood pressure. These findings highlight the importance of improving sleep patterns among older adults as a measure to help lower blood pressure, particularly for those with a history of hypertension. Additionally, maintaining good sleep quality is a vital strategy in preventing increased blood pressure.

Keywords: Elderly; Hypertension; Sleep Duration; Sleep Quality

INTRODUCTION

Hypertension is defined as a condition of blood pressure that is higher than normal and contributes to more than 10 million deaths annually globally. This is indicated by an increase in systolic pressure above 140 mmHg and diastolic pressure exceeding 90 mmHg (Ledoh et al., 2024). Hypertension is often found as a major public health problem and a major risk factor for cardiovascular disease, including stroke, heart failure, and coronary heart disease (Kurniawan, 2020). In Indonesia, the prevalence of hypertension continues to increase and has occurred in the population aged ≥18 years and has reached 34.1%, with many cases remaining undiagnosed and uncontrolled (Anwar et al., 2023). If left untreated for a long time, hypertension can cause health problems for those who experience it. In 2022, 1.28 billion adults worldwide had hypertension, covering 25% of the global adult population (Prasetya & Chanif, 2020). The latest report from the WHO, (2025) revealed that the prevalence of hypertension at the global level continues to increase, with more than 30% of the world's adult population affected by this condition. Based on the latest data from the Kemenkes, (2023) the prevalence of hypertension was recorded at 34.11%. This increase is quite significant, especially in the age group over 60 years, with a percentage of 25.8%. The mortality rate from hypertension is also quite high, with an estimated 10.2 million deaths due to complications from this condition that year. It is estimated that more than 63 million Indonesians are known to have hypertension, with the death toll from this disease reaching 427,218 cases (Sari & Purwono, 2022). According to the Banjarmasin City Health Office,

Pekauman Community Health Center recorded the highest number of hypertension cases in 2023

In line with this, various studies have shown that hypertension is not only a major risk factor for cardiovascular disease but also contributes significantly to global morbidity and mortality. Given this, early detection, effective treatment, and primary prevention strategies are crucial to mitigate the negative impacts of hypertension (Setiandari, 2022). Lifestyle irregularities, such as a high-sodium diet, lack of physical activity, and poor sleep quality, further exacerbate the incidence of hypertension in the productive age group (Saputra & Anam, 2016). This situation is exacerbated by low public awareness of their blood pressure status, resulting in many cases going undiagnosed or not receiving adequate treatment (Wulandari et al., 2022).

One aspect that is often overlooked in the management of hypertension in the elderly is sleep quality and duration, even though both factors significantly influence blood pressure control. Sleep patterns, including sleep duration and quality, are crucial. Sleep is a crucial physiological process that influences the regulation of the cardiovascular and metabolic systems, as well as the body's stress response. Sleep disturbances, whether in the form of insufficient sleep duration or poor sleep quality, have been shown to affect sympathetic tone, renin-angiotensin-aldosterone activity, and the balance of stress hormones like cortisol, ultimately leading to increased blood pressure (Nadila et al., 2024). According to a report by the National Commission on Sleep Disorder Research, approximately 30 million adolescents and adults in the United States are estimated to experience chronic sleep problems (Thichumpa et al., 2018). The study was conducted by Ungvari et al., (2025) A nine-year study indicated that people who slept less than six hours per night had a 70% higher risk of health problems and a 70% higher mortality rate compared to those who slept seven to eight hours per night. Juwita et al., (2023) It's been recorded that approximately half of Indonesians over the age of 60 experience sleep problems. Among various types of sleep disorders, insomnia is the most common.

Sleep quality and duration are important factors that can impact blood pressure in the elderly. Good and adequate sleep plays a significant role in maintaining heart and blood vessel health, which directly impacts blood pressure regulation (Demur, 2021). Sleep has a homeostatic function that plays a role in maintaining the body's fitness and is also crucial as a source of energy reserves. Everyone needs quality sleep, as it directly impacts overall health and heart rate. Poor-quality sleep, or less than 7 hours of sleep per night, has been linked to increased blood pressure (Ariyani, 2020). Several studies have shown that individuals who sleep less than 6 hours per night have a higher risk of hypertension than those who get adequate sleep. Similarly, poor sleep quality can lead to increased systolic and diastolic blood pressure due to prolonged activation of the sympathetic nervous system (Daulay & Sidabutar, 2020). In people with hypertension, sleep patterns often change due to physical discomfort, the use of certain medications, and anxiety related to their health condition. This can worsen hypertension if not properly managed. At the primary care level, such as community health centers (Puskesmas), hypertension management efforts have focused more on controlling conventional risk factors such as diet, physical activity, and medication adherence. However, sleep is a crucial factor that is often overlooked, even though it significantly contributes to blood pressure stability (Fitria et al., 2022).

Pekauman Community Health Center, as a primary healthcare facility that handles a large number of hypertension cases, faces challenges in comprehensively monitoring patients' lifestyle factors, including sleep patterns. Suboptimal education on healthy sleep and minimal screening related to sleep duration and quality can lead to ineffective hypertension control efforts. Therefore, research is needed to examine the relationship between sleep duration and quality, with blood pressure in hypertension patients in this region. This study is expected to provide an empirical overview of the extent to which sleep patterns affect blood pressure in hypertension patients. The results can inform the development of interventions based on healthy sleep education at Pekauman Community Health Center, while also enriching the literature on lifestyle factors that influence hypertension management in primary care.

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METHOD

The research method used in this study was a quantitative method with a descriptive correlative approach and a cross-sectional design. This study was conducted in the Pekauman Community Health Center, Banjarmasin, working area. The population used in this study was all elderly patients with hypertension who came for treatment at Pekauman Community Health Center. The sample used in this study consisted of 95 respondents. This sampling was in accordance with the inclusion criteria: elderly aged 55–65 years (early elderly), 66–74 years (young elderly), and 75–90 years (old elderly) who had been diagnosed with primary hypertension, experienced sleep disturbances or complaints, with a focus on those with significant sleep disturbances, and expressed their willingness to participate. Exclusion criteria were established for elderly with severe physical or mental disorders that prevented participation in the study or those undergoing treatment or therapy that directly affected sleep quality and blood pressure, such as the use of sleeping pills or intensive antihypertensive therapy.

The data collection instrument used in this study was the Pittsburgh Sleep Quality Index (PSQI) questionnaire. This instrument covers seven assessment aspects: sleep quality, time to fall asleep (latency), sleep duration, sleep efficiency, sleep disturbances, use of sleeping pills, and daytime dysfunction (Dariah & Okatiranti, 2015). In terms of sleep duration, the assessment scale is categorized into three categories: short sleep (<6 hours per night), normal sleep (7–9 hours per night), and excessive sleep (more than 9 hours per night). This questionnaire consists of 19 questions to measure sleep disturbances. A score of <5 indicates good sleep quality, while a score above 5 indicates poor sleep quality. The higher the score, the greater the sleep disturbance in people with hypertension. Data were analyzed using univariate analysis through frequency distribution and bivariate analysis using the Spearman Rank Correlation Test

RESULTS

Univariate Analysis

Table 1. Respondent Characteristics

Characteristics	Category	f	%
Gender			
	Male	34	35.8
	Female	61	64.2
Age			
	Elderly	55	57.9
	Younger Elderly	35	36.8
	Older Elderly	5	5.3

Source: Primer 2025

Based on Table 1, respondent characteristics show that the majority of elderly respondents in this study were female, totaling 61 (64.2%). Meanwhile, there were 34 male elderly respondents, and the largest age group of elderly respondents was in the 55–65 year age range (early elderly), comprising 55 (57.9%). Furthermore, 35 (36.8%) were in the 66–74 year age group, and 5 (5.3%) were in the older elderly category (75–90 years).

Table 2. Overview of Sleep Duration, Sleep Quality, and Blood Pressure Among Respondents

Characteristics	Category	f	%
Sleep Duration			
	Short Sleep	50	52.6
	Normal	45	47.4
Sleep Quality			
	Good	40	42.1
	Poor	55	57.9
Blood Pressure			
	Pre-Hypertension	2	2.1
	Grade I Hypertension	42	44.2
	Grade II Hypertension	51	53.7

Source: Primer 2025

Based on Table 2, the overview of sleep duration, sleep quality, and blood pressure shows that the majority of respondents experienced short sleep duration, namely 50 elderly (52.6%). Meanwhile, 45 elderly (47.4%) had normal sleep duration, and the majority of elderly respondents were recorded as having poor sleep quality, namely 55 (57.9%). Forty elderly (42.1%) had good sleep quality, and the majority of respondents, namely 51 (53.7%), were classified as having stage II hypertension. Furthermore, 42 elderly (44.2%) were classified as having stage I hypertension, and only 2 elderly (2.1%) were recorded as having pre-hypertension.

Bivariate Analysis

Table 3. Analysis of the Relationship between Sleep Duration and Blood Pressure

Variable		Classification of Hypertension Degrees			Total
		Pre-Hypertension	Grade I Hypertension	Grade II Hypertension	
Sleep Duration	Short Sleep	0	7	43	50
	Normal	2	35	8	45
Total		2	42	51	95
p-value			0.000		
Correlation Coefficient			-0.683		

Sumber :Primer 2025

Table 3. Results of the analysis of the relationship between sleep duration and blood pressure show that the statistical test results for the relationship between sleep duration and blood pressure in the elderly in the Pekauman Community Health Center work area yielded a Sig. (2-tailed) value of 0.000. Because this significance level is less than 0.05, it can be concluded that Ha is accepted and Ho is rejected based on the results of the significance test. This means that the analysis indicates a significant relationship between sleep time and blood pressure in the elderly in the area.

Table 4. Analysis of the Relationship between Sleep Quality and Blood Pressure

Variable		Classification of Hypertension Degrees			Total
		Pre-Hypertension	Grade I Hypertension	Grade II Hypertension	
Sleep Duration	Short Sleep	20	32	6	40
	Normal		10	45	55
Total		2	42	51	95
p-value			0.000		
Correlation Coefficient			-0.683		

Source: Primer 2025

Based on Table 4, the analysis of the relationship between sleep quality and blood pressure shows that the statistical test results for the relationship between sleep quality and blood pressure in elderly people at the Pekauman Community Health Center yielded a significance value (Sig. 2-tailed) of 0.000. Because this value is below 0.05, it can be concluded that Ha is accepted and Ho is rejected. These results confirm that sleep quality has a significant relationship with blood pressure within six hours, with some even sleeping only three to five hours per night. This situation indicates that insufficient sleep is a serious problem that requires attention in efforts to improve the well-being of elderly people.

DISCUSSION

The sleep duration of the majority of elderly people in this study was classified as short, at 50 people (52.6%), while the other 45 people (47.4%) had normal sleep durations. These data indicate that sleep disorders, particularly related to short sleep duration, are a fairly common problem among elderly people. Most of them do not get enough rest at night, with daily sleep duration generally being less than six hours, with some even sleeping only between three and five hours per night. This situation indicates that lack of sleep is a serious problem that needs to be addressed in efforts to improve the welfare of the elderly (Chinthia et al., 2022).

These findings align with previous research conducted by Greenlund & Carter, (2021), which revealed that short sleep duration can trigger excessive activity in the sympathetic nervous system. This activity is characterized by increased heart rate variability in the low-frequency spectrum, a decrease in high-frequency activity, a spike in blood norepinephrine levels, and a reduced ability of the endothelium to dilate blood vessels. Furthermore, poor-quality sleep in the elderly can be triggered by several factors, including increasing age, health conditions such as hypertension, diabetes, heart disease, neurological disorders, and hormonal disorders such as hyperthyroidism. Therefore, these results emphasize the importance of early intervention for sleep patterns in the elderly. Sleep deprivation not only impacts comfort but can also disrupt overall body function. Approaches such as cognitive-behavioral therapy, gentle exercise, adjusting the sleeping environment, and stress management are some effective alternatives for

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treating sleep disorders in the elderly.

Physiologically, sleep functions as a recovery phase for the body, during which cardiovascular activity decreases, including a decreased heart rate and peripheral vasodilation. When sleep duration is reduced, these recovery mechanisms become suboptimal, resulting in increased levels of stress hormones such as cortisol and catecholamines. This condition leads to vasoconstriction and increased cardiac workload, contributing to both acute and chronic increases in blood pressure (Andini et al., 2023).

The findings of this study align with several previous studies showing that individuals with short sleep duration have a higher risk of developing hypertension. These studies consistently demonstrate that irregular or insufficient sleep patterns can cause autonomic nervous system dysregulation and metabolic changes that lead to increased blood pressure. (Umrana, 2017). Dengan demikian, durasi tidur dapat dipandang sebagai salah satu indikator keseimbangan fisiologis yang memiliki dampak langsung terhadap kesehatan kardiovaskular (Octarini et al., 2023).

Furthermore, the results of this study also suggest that some hypertension patients in the Pekauman Community Health Center (Puskesmas) area still lack adequate sleep patterns. Factors such as stress, workload, living conditions, and lifestyle factors such as caffeine consumption or device use before bed can impact sleep quality and duration. This situation suggests that promotive and preventive interventions regarding the importance of adequate sleep need to be improved at the primary healthcare level (Nisa et al., 2022).

The implications of these findings are highly relevant for nursing practice and public health. Education on sleep hygiene, stress management, and lifestyle modifications should be part of the comprehensive management of patients with hypertension. Furthermore, healthcare providers can incorporate sleep pattern assessments as a routine component of hypertension risk factor assessments, allowing for more comprehensive blood pressure control efforts. Overall, this study confirms that inadequate sleep duration contributes to increased blood pressure in hypertensive patients. Therefore, interventions to improve healthy sleep habits should be considered as an important strategy in hypertension management at the primary healthcare level, particularly at the Pekauman Community Health Center in Banjarmasin.

This study found that the majority of elderly people experienced poor sleep quality, with 55 (57.9%) experiencing poor sleep quality, while 40 (42.1%) experienced good sleep quality. This data suggests that sleep quality issues are quite common in the elderly population. One prominent indicator was the length of time it took to fall asleep after lying down, which showed a relatively high score This indicates that many older adults take a long time to fall asleep, likely due to anxiety, disturbing thoughts, or physical discomfort. Furthermore, sleep duration also scored high, with most older adults getting less than six hours of sleep per night, with some even sleeping only three to five hours (Rochani, 2019).

This inadequate sleep duration certainly impacts overall sleep quality, due to the lack of rest the body needs for physical and mental recovery. Another component that also scores high is sleep disturbance, which includes frequent nighttime awakenings, difficulty falling asleep, and environmental disturbances such as noise or discomfort (Dewi, 2020). Repeated occurrences of these disturbances disrupt sleep continuity and can lead to prolonged fatigue and cognitive decline in older adults.

These findings align with research by Nurhikmawati et al., (2024), which confirmed a correlation between sleep quality and blood pressure in those with hypertension. Sleep disturbances can trigger the activity of two major body systems: the sympathetic nervous system, triggered by the adrenal medulla, and the hypothalamic-pituitary-adrenal (HPA) axis. When a person experiences sleep disturbances or stress, the adrenal glands release the hormones norepinephrine and epinephrine into the bloodstream, resulting in vasoconstriction. This can contribute to increased blood pressure. Poor sleep not only disrupts stress hormones like cortisol but also causes an increased response from the sympathetic nervous system, ultimately worsening hypertension and increasing the risk of recurrence.

Therefore, maintaining quality sleep is important to support overall health, especially for the elderly with a history of hypertension, as an effort to prevent spikes in blood pressure.

The practical implications of this study include the finding that sleep duration and quality are significantly associated with blood pressure, indicating the need for the Pekauman Community Health Center to strengthen education on sleep hygiene for the elderly. This education could include the importance of a regular sleep schedule and maintaining a comfortable sleep environment. Furthermore, based on these results, the Community Health Center could develop healthy sleep intervention programs, such as pre-bedtime relaxation, stress counseling (as stress also affects sleep quality), and routine Sleep Factor screening, which involves assessing sleep duration and quality during examinations.

CONCLUSION

The sleep quality influence blood pressure in elderly people in the Pekauman Community Health Center work area. Elderly families can help provide a home environment that supports healthy sleep patterns (lighting, minimal noise), support elderly sleep routines and remind them to get enough rest and monitor elderly compliance in taking antihypertensive medication and monitoring blood pressure regularly. In addition, health workers can provide routine education about sleep hygiene to older adults during every health care visit and add assessment of sleep duration and quality to hypertension screening.

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