

The Relationship Between Sleep Quality and Hypertension Levels in The Elderly at Gedangan Public Health Center

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Article Info	Abstract
Article History Submitted, 2025-11-02 Accepted, 2025-11-30 Published, 2025-12-31 Keywords: Sleep quality, hypertension, elderly	The elderly are a vulnerable age group experiencing various health problems, such as hypertension. Poor sleep quality contributes to high blood pressure by affecting the autonomic nervous system, hormonal balance, and inflammatory processes in the body. If hypertension continues to rise, complications such as stroke can occur. This study aims to determine the relationship between sleep quality and hypertension levels in the elderly at the Gedangan Community Health Center. This study used a descriptive correlational design with a cross-sectional approach. The population of 482 elderly people was selected using purposive sampling. The sample size for this study was 218 elderly people with hypertension. Sleep quality was measured using the Pittsburgh Sleep Quality Index (PSQI) questionnaire, while hypertension levels were obtained from medical records. Data analysis was performed using the Spearman correlation test. The study showed that the majority of elderly people had poor sleep quality (97.7%). Furthermore, the highest blood pressure category was stage 1 hypertension (40.8%). The Spearman correlation test showed a significant positive relationship between sleep quality and blood pressure ($r = 0.233$, $p = 0.001$), indicating that the poorer the sleep quality, the higher the blood pressure in elderly people. There is a significant relationship between sleep quality and hypertension levels in the elderly at the Gedangan Community Health Center. Therefore, it is important to raise awareness among the elderly about the importance of maintaining sleep quality to reduce the risk of hypertension and other health complications.

Introduction

The elderly are one of the age groups most susceptible to various health problems. Aging is a multidimensional process, characterized by alternating damage and repair within the body or its systems, occurring at varying times and rates (Leba et al., 2023). The elderly are at high risk for degenerative diseases such as coronary artery disease, diabetes mellitus, high blood pressure, gout, and cancer. One of the most common diseases among the elderly is high blood pressure (hypertension) (Ningtyas, 2024). Hypertension is often referred to as the silent killer because it often occurs without symptoms and is one of the causes of death worldwide (Helvia, 2021). Hypertension is a non-communicable disease, a person is said to be hypertensive if, after a five-minute examination at rest, there is an increase in systolic blood pressure to >140 mmHg and diastolic blood pressure >90 mmHg (Hasanah, 2020). In Indonesia, the highest risk factor with the fourth cause of death is hypertension at 10.2%, according to the Indonesian Health Survey (SKI) and a cohort study of non-transmissible diseases (NCDs) (2011-2021). Data from the 2023 survey showed that 59.1% of the causes of disability (vision, hearing, walking) in those aged 15 years and above were mostly non-communicable diseases, especially hypertension (22.2%) (Suarayasa et al., 2023).

Sleep quality refers to a person's ability to maintain sleep and achieve sufficient REM and NREM sleep stages. Several factors influence sleep quality, including activity levels and an individual's health. The World Health Organization (WHO) reported in 2011 that approximately 18% of the world's population experiences sleep deprivation. In 2017, the prevalence of sleep deprivation among older adults in the United States reached 83,952, while the lowest was in Mexico at 8,712. In Indonesia, in 2014, approximately 10% of older adults experienced sleep deprivation, equivalent to approximately 28 million people out of a total population of 238 million. The prevalence of this sleep disorder is also very high in Java and Bali (Fazriana et al., 2023).

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Poor sleep quality can lead to higher blood pressure in older adults. Poor sleep-in older adults act through multiple, reinforcing pathways immediate autonomic surges (sympathetic activation), intermittent hypoxia from OSA, inflammation and endothelial damage, arterial stiffening and impaired reflexes, circadian disruption, and metabolic dysfunction which together increase the likelihood of developing or worsening hypertension. The elderly are particularly vulnerable because of age-related arterial stiffness and reduced baroreflex buffering. As explanation, poor sleep (short sleep, fragmentation, frequent awakenings) increases sympathetic nervous system activity and reduces parasympathetic (vagal) tone. That raises heart rate and vascular resistance and, over time, produces sustained higher blood pressure. Obstructive sleep apnoea (OSA), repeated airway collapse causing intermittent hypoxia and arousals is especially common in older people and is a major, well-established cause of hypertension. Poor sleep increases systemic inflammation and oxidative stress. These changes damage the endothelium (the inner lining of blood vessels), impair nitric-oxide-mediated vasodilation, and increase vascular tone, all pathways that raise blood pressure chronically. Aging itself causes stiffer arteries and reduced baroreflex sensitivity (the reflex that buffers BP changes). Poor sleep promotes arterial stiffness and worsens the ability of an older person’s autonomic reflexes to regulate BP, so the same sleep disturbance produces larger, more persistent BP increases in elderly people than in the young. Irregular sleep timing or circadian misalignment can blunt the normal nighttime dip in blood pressure (the “nocturnal dip”). Loss of dipping is independently associated with higher cardiovascular risk and is often seen in older adults with fragmented sleep or OSA. Chronic poor sleep promotes insulin resistance, appetite dysregulation, and weight gain — all risk factors for hypertension. In older adults these metabolic changes interact with preexisting vascular aging to accelerate BP elevation.

Based on preliminary study conducted at Gedangan Community Health Center showed that there were 482 elderly individuals with hypertension. From interviews with six elderly participants, it was found that four of them experienced poor sleep quality, such as difficulty falling asleep within 30 minutes after lying down, frequent awakenings during the night, and waking up to use the bathroom. Meanwhile, the other two elderly individuals had fairly good sleep quality, although they occasionally woke up to go to the bathroom. This indicates that most elderly individuals experience sleep quality disturbances despite efforts to achieve good sleep quality. Based on the above phenomenon, the researcher is interested in conducting a study entitled The Relationship Between Sleep Quality and the Level of Hypertension in the Elderly at Gedangan Community Health Center.

Methods

This study used a descriptive correlational design with a cross-sectional approach. The population was 482 elderly people, and the sampling method was purposive. The sample size for this study was 218 elderly people with hypertension. Sleep quality was measured using the Pittsburgh Sleep Quality Index (PSQI) questionnaire, while hypertension levels were obtained from medical records. Data analysis was performed using the Spearman correlation test.

Results and Discussion

Table 1. Respondent Characteristics

		Amount (frequency)	Percentage (%)
Gender	Man	63	28.9
	Woman	155	71.1
Age	Young Elderly 45-59 years	84	38.7
	Seniors 60-74 years	129	59
	Elderly people aged 75-90 years	5	2.3
	Very elderly people aged >90 years	0	0
Total (n)		218	100.0

Table 1 shows that the majority of elderly people at the Gedangan Community Health Center are aged 60-74 years (129 people) and 155 women (71.1%).

Table 2. Classification of sleep quality and blood pressure categories

Variable		frequency (f)	Percentage (%)
Sleep Quality	Good	5	2.3
	Bad	213	97.7
Blood Pressure	Normal	7	3.2
	Pre-Hypertension	32	14.7
	Stage 1 Hypertension	89	40.8
	Stage 2 Hypertension	76	34.9
Total		218	100.0

Table 2 shows that the sleep quality of 213 elderly people (97.7%) at the Gedangan Community Health Center is generally poor. Based on the blood pressure classification, 89 elderly people (40.8%) at the Gedangan Community Health Center are classified as having stage 1 hypertension.

Table 3. Correlation Test
Systolic Blood Pressure

Sleep Quality	Normal		Pre HT		Stage 1 HT		Stage 2 HT		HT Crisis		r	P-value
	n	%	n	%	n	%	n	%	n	%		
Good	1	0,5	4	1,8	0	0,0	0	0,0	0	0,0	0.233	0,001
Bad	6	2,8	28	12,8	89	40,8	76	34,9	14	6,4		

Table 3 shows that 5 respondents (2.3%) had good sleep quality, 1 of whom (0.5%) was in the normal category, and 4 respondents (1.8%) were in the pre-hypertension category. Meanwhile, 213 respondents (97.7%) had poor sleep quality, of whom 89 (40.8%) had stage one hypertension. Spearman's correlation analysis showed a significant positive relationship between sleep quality and blood pressure (r=0.233) and a p-value of 0.001.

Gender

Based on the results of the study, based on gender characteristics, it was found that the elderly at the Gedangan Community Health Center were categorized as female, with 155 (71.1%) and 63 (28.9%) being male. Based on research by (Ningtyas, 2024) entitled "The Relationship between Sleep Quality and the Incidence of Hypertension in the Elderly," it shows that there are more female respondents than male. The increased prevalence of hypertension in women compared to men is due to hormonal factors. With age, estrogen levels in women decrease, increasing their risk of developing hypertension.

This statement aligns with this research, as female elderly individuals are more likely to experience hypertension than male elderly individuals. Therefore, the researchers demonstrated that the results of their previous research showed that female elderly individuals at the Gedangan Community Health Center experienced hypertension more frequently than male elderly individuals.

Age

Based on the analysis of respondents' ages, the age distribution shows a fairly wide range, ranging from 46 to 85 years. Of the 218 respondents, the ages of 59 and 66 had the highest frequency, with 20 respondents each, or 9.2% of the total. Furthermore, the age group of 57 was also quite dominant, with 15 respondents, or 6.9%. Most respondents were in the 55 to 70 age group, comprising more than half of the total respondents, while the number of respondents aged 74 and over was smaller. Cumulatively, those aged up to 59 comprised 38.5% of respondents, while those aged up to 66 comprised 68.8%. Meanwhile, the number of respondents aged 74 and over decreased, indicating that with increasing age, the number of respondents in this group decreases. These findings indicate that the majority of respondents are elderly, particularly in the 55 to 70 age range.

Age is one of the factors that influences blood pressure. As people age, they experience physical changes and decreased organ function. The older a person gets, the greater the likelihood of experiencing various problems, such as sleep disturbances, changes in eating patterns, lack of physical activity, and stress, which can contribute to various diseases, including hypertension. Poor sleep quality in the elderly has a significant impact on increased blood pressure, which can ultimately trigger hypertension and become a risk factor for various other diseases (Maharani et al., 2021)

Overview of Sleep Quality in The Elderly

Based on the research results, the majority of elderly people at the Gedangan Community Health Center experienced poor sleep quality, with 213 (97.7%) falling into this category, while only 5 (2.3%) experienced good sleep quality. These findings indicate that the majority of elderly people at the Gedangan Community Health Center experience sleep disorders.

Good sleep quality refers to a person's ability to get sufficient and restful sleep for an optimal duration. Conversely, poor sleep quality is characterized by difficulty maintaining sleep, frequent nighttime awakenings, and feeling unrefreshed upon waking (Sari et al., 2024).

The results of this study align with research at the Sintuk Community Health Center, which showed a high rate of poor sleep quality in the elderly, with the majority of respondents being female. Research by Helvia (2021) also supports these findings, with data showing that the 60–74 age group dominated with 54 people (84.4%), the majority were female (48 people or 75%), and 49 people (76.7%) had a family history of hypertension. Furthermore, isolated systolic hypertension was the most common type of hypertension, found in 25 people (39.1%). A total of 53 people (82.8%) had poor sleep quality, and there was a significant relationship between sleep quality and the severity of hypertension in the elderly at the Sintuk Community Health

Center in 2021 ($P = 0.000 < 0.05$). Thus, it can be concluded that sleep quality influences the level of hypertension in the elderly.

Common sleep disorders experienced by elderly people at the Gedangan Community Health Center include difficulty falling asleep within 30 minutes of lying down (177 people, or 81.2%), frequent nighttime awakenings (123 people, or 56.4%), and daytime dysfunction (87 people, or 39.9%). Contributing factors to these problems include physiological changes due to aging, certain medical conditions, and psychological disorders such as stress and anxiety.

According to researchers, poor sleep quality can hinder daily activities and negatively impact cognitive function and mental health. Poor sleep increases the risk of high blood pressure, which can contribute to heart disease and stroke. Furthermore, sleep disturbances can lead to difficulty concentrating, impaired memory, increased stress and anxiety, and excessive daytime fatigue. Therefore, it is important to improve sleep quality by maintaining a regular sleep pattern, creating a comfortable environment, and managing stress effectively.

Overview of Blood Pressure Classification in The Elderly

The results of the study indicate that the majority of elderly people at the Gedangan Community Health Center have hypertension, with 89 (40.8%) falling into the Stage 1 Hypertension category and 76 (34.9%) falling into the Stage 2 Hypertension category. This data was obtained from blood pressure measurements conducted during Prolanis activities at the Gedangan Community Health Center.

This finding is supported by research conducted by Sari et al. (2024) in a study entitled "The Relationship Between Sleep Quality and Blood Pressure in Hypertension Patients in the Summersari Jember Community Health Center Work Area." The study showed a relationship between sleep quality and systolic blood pressure ($p = 0.020$) and diastolic blood pressure ($p = 0.014$) in the elderly at the Setrorejo Village Elderly Health Post.

According to research, increased systolic blood pressure in the elderly is influenced by several factors, such as increasing age and less than optimal quality of rest. With age, blood vessel elasticity decreases, forcing the heart to work harder to pump blood, ultimately increasing blood pressure. Furthermore, plaque buildup on artery walls due to high cholesterol levels and inflammation can narrow blood vessels, further increasing blood pressure. Other contributing factors include hormonal changes, decreased physical activity, and unhealthy diet and lifestyle. This suggests that increased blood pressure in the elderly is closely related to the severity of their hypertension.

The Relationship between Sleep Quality and Hypertension Levels in The Elderly

The study results showed that 5 respondents (2.3%) had good sleep quality, 1 (0.5%) had normal sleep, and 4 (1.8%) had pre-hypertension. Meanwhile, 213 respondents (97.7%) had poor sleep quality, including 89 (40.8%) with stage 1 hypertension and 76 (34.9%) with stage 2 hypertension.

The Spearman correlation test results showed a significant positive relationship between sleep quality and hypertension levels in the elderly at the Gedangan Community Health Center. The correlation coefficient between sleep quality and blood pressure was ($r=0.233$) with a significance value ($p\text{-value}=0.001$). This indicates that poorer sleep quality will affect high blood pressure, both systolic and diastolic. The results of this study are in line with medical theory which states that poor sleep quality can contribute to increased blood pressure (Subagiarta et al., 2024). Sleep disorders, such as insufficient sleep duration, can increase sympathetic nervous system activity and inhibit the cardiovascular recovery process during sleep, which will ultimately lead to increased blood pressure (Ningtyas, 2024).

This study is in line with research conducted by (Khadijah et al., 2023) there is a relationship between sleep quality and blood pressure ($p = 0.045$) $r = 0.0242$. Elderly people at the Gedangan Health Center who have poor sleep quality are 213 people (97.7%) where there are 5 people (2.3%) who have good sleep quality. One of the reasons is because many elderly people experience poor sleep quality in this study, indicated by 213 elderly people (97.7%) answering or stating that in the past month they often wake up at night as many as 123 people (56.4%), wake up to go to the bathroom as many as 75 people (34.9%), daytime dysfunction as many as 87 people (39.9%), existing congenital diseases (such as heart disease, and respiratory disorders), and the use of certain medications. Hypertension or high blood pressure is a condition where blood pressure in the blood vessels increases significantly.

The study results showed that 89 people (40.8%) had stage 1 hypertension, and 76 people (34.9%) had stage 2 hypertension. Unhealthy lifestyles, such as lack of activity, a high-salt diet, stress, and frequent nighttime awakenings, also contributed to high blood pressure in the elderly at the Gedangan Community Health Center.

Conclusion and Suggestion

There is a significant relationship between sleep quality and hypertension levels in the elderly at the Gedangan Community Health Center. Therefore, it is important to raise

awareness among the elderly about the importance of maintaining sleep quality to reduce the risk of hypertension and other health complications.

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