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Overview of Factors Determining Sleep Quality in Hypertensive Patients at Tuminting Health Center, Manado City

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A B S T R A C T

Hypertension is a chronic disease that has a wide impact on health, not only increasing the risk of cardiovascular complications but also closely related to sleep quality problems. Sleep disorders in hypertensive patients can worsen blood pressure regulation through activation of the sympathetic nervous system, increased stress hormones, and disruption of circadian rhythms. Therefore, sleep quality is an important aspect in hypertension management. This study aims to describe the factors that determine sleep quality in hypertensive patients at the Tuminting Community Health Center in Manado City. The study used a quantitative descriptive design with a cross-sectional approach. The sample consisted of 68 respondents with hypertension selected through purposive sampling. Variables included age, sex, occupation, income, stress level, smoking habits, use of antidepressant medication and sleep quality. Data collection instruments used the Pittsburgh Sleep Quality Index (PSQI), the Perceived Stress Scale-10 (PSS), and additional questionnaires, with univariate analysis. The results showed that 66.2% of respondents had poor sleep quality, while 33.8% had good sleep quality. Most respondents with poor sleep quality were aged ≥45 years (76.7%), male (80.0%), employed (75.9%), income above the city minimum wage (72.2%), and those with moderate stress levels (80.0%). All respondents who smoked experienced poor sleep quality (100%), while no antidepressant use was found (0%). The study concluded that the majority of hypertension patients at the Tuminting Community Health Center experienced poor sleep quality, primarily determined by factors such as age, sex, occupation, income, stress, and smoking habits. Efforts to improve sleep quality can be carried out through stress management education, controlling smoking habits, and strengthening a healthy lifestyle in hypertension patients

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INTRODUCTION

Hypertension remains a major global health issue, referred to as the silent killer because it rarely presents obvious symptoms. This condition is dangerous because sufferers are generally unaware they have it, and it is often only diagnosed after complications arise. Its greatest risk is being a primary trigger for cardiovascular diseases such as heart attack, stroke, and kidney disease (Pradono, Kusumawardani, and Rachmalina, 2020).

The prevalence of hypertension shows significant variation across different regions and country income groups. Data from the WHO (2023) reveals that globally, approximately 1.28 billion adults suffer from hypertension, with Africa reporting the highest rate (27%) and the Americas the lowest (18%). At the national level, Indonesia has a higher prevalence than both regions, reaching 30.8% (Ministry of Health, 2023). More detailed data from North Sulawesi shows a gap between doctor diagnoses (12.9%) and measurement results (29.2%), indicating many undiagnosed cases. At the city level, Manado recorded 43,368 cases. Meanwhile, at the primary healthcare level, Puskesmas Tuminting alone registered 7,230 individuals diagnosed with hypertension in 2024.

One important aspect that plays a role in the health of hypertension patients is sleep quality. Quality sleep has a direct impact on blood pressure, metabolic function, and hormonal balance. Poor sleep quality has been associated with an increased risk of high blood pressure, cardiovascular disorders, and other hypertension-related complications (Zheng et al., 2024).

LITERATURE RIVIEW

Physiologically, sleep quality and blood pressure have a complex bidirectional relationship. When sleep is disrupted, the sympathetic nervous system becomes more active, leading to increased nighttime blood pressure. This condition is known as non-dipping blood pressure, which is the failure of blood pressure to decrease during sleep and is closely associated with increased cardiovascular morbidity (Dijk and Landolt, 2019). Furthermore, sleep disturbances also disrupt the regulation of hormones such as cortisol and melatonin, which play an important role in blood pressure regulation. A study by Nazmi et al. (2024) It shows that poor sleep patterns can lead to an imbalance of cortisol hormones and activation of the sympathetic nervous system, resulting in increased blood pressure.

The quality of sleep in hypertensive patients also has specific characteristics that distinguish it from patients with other chronic diseases. In hypertensive patients, sleep disturbances are generally more related to irregular circadian rhythms and increased nocturnal blood pressure, whereas in patients with other chronic diseases such as diabetes mellitus or chronic obstructive pulmonary disease (COPD), sleep disturbances are more often associated with nocturnal hypoglycemia or shortness of breath during sleep (Edmealem et al., 2020). Additionally, the pharmacological effects of antihypertensive drugs such as diuretics also play a role in reducing the sleep quality of patients. This is caused by nocturia symptoms that arise as a side effect of these drugs.

Research on sleep quality in individuals with hypertension is increasingly gaining attention in the field of public health. Globally, around 30–40% of the

adult population experiences sleep disturbances, with the prevalence of chronic insomnia reaching 10–15%. In Indonesia, the results of the 2022 National Socioeconomic Survey (Susenas) revealed that more than 25% of adults experience significant sleep disturbances, such as insomnia and sleep apnea.

Research conducted by Agustin and Asnaningsih (2022) found that individuals with poor sleep quantity are approximately 1.527 times more likely to suffer from hypertension compared to those with good sleep quantity. This supports the hypothesis that poor sleep quality is not only a consequence of hypertension but also has the potential to be a predisposing factor for the development of hypertension. (Agustin and Asnaningsih, 2022)

Various factors can determine the sleep quality of individuals with hypertension, from physiological, psychological, to environmental aspects. Physiological factors include underlying medical conditions, such as obesity, diabetes, and other cardiovascular diseases, which are often associated with sleep disturbances. Additionally, the use of certain antihypertensive medications can also influence a person's sleep patterns. Psychologically, stress and anxiety play an important role in determining sleep quality. Hypertensive patients often experience chronic stress due to uncontrolled blood pressure, which can ultimately disrupt their sleep cycles. From an environmental perspective, factors such as noise, lighting, and bed comfort can also impact the sleep quality of individuals with hypertension (Son et al., 2024). Nevertheless, further research is still needed to gain a deeper understanding of the factors that play a role in determining sleep quality Hypertension sufferers in various contexts, especially at the primary healthcare level such as community health centers.

Based on the background description, the author is interested in researching the depiction of factors determining sleep quality in hypertension sufferers at the Tuminting Community Health Center in Manado City. This study aims to identify the depiction of factors determining sleep quality in hypertension sufferers at the Tuminting Community Health Center in Manado City.

METHODOLOGY

This type of research is quantitative descriptive with a cross-sectional approach.The research was conducted at Tuminting Community Health Center, Manado City, in July–August 2025. The population of the study consisted of all hypertension patients recorded at Tuminting Community Health Center in 2024, totaling 7,230 individuals. The research sample consisted of 68 respondents selected using purposive sampling according to predetermined inclusion and exclusion criteria. The variables in this study were age, gender, occupation, income, stress level, smoking habits, antidepressant consumption, and sleep quality. Data were collected through interviews using the Pittsburgh Sleep Quality Index (PSQI) to assess sleep quality, the Perceived Stress Scale-10 (PSS) to measure stress levels, and additional questionnaires for demographic data and respondent habits. The analysis used included univariate analysis to describe the frequency distribution of each research variable

RESULT

This section explains the distribution of respondent characteristics, factors determining sleep quality, categories of sleep quality, and cross-tabulation of determinants with sleep quality categories. This is shown in Tables 1-4.

Table 1. Distribution of Respondent Characteristics

Respondent Characteristics	**n**	%
Age		
19-44	4	5.9
45-59	30	44.1
>60	34	50
Total	68	100
Gender		
Male	15	22.1
Female	53	77.9
Total	68	100
Respondent Characteristics	**N**	%
Livelihood		
There	29	42.6
Nothing	39	57.4
Total	68	100
Income		26.5
Up UMK	50	73.5
Under UMK	18	26.5
Total	68	100

Referring to Table 2, it shows the demographic distribution of 68 research respondents. The majority of respondents were in the age group >60 years, accounting for 50%, followed by the 45-59 age group at 44.1%. Female respondents numbered 77.9% while males accounted for 22.1%. A total of 57.4% of respondents were unemployed, while the remainder had occupations. Regarding income, most respondents (73.5%) had an income below the Manado City Minimum Wage in 2025, while only 26.5% had an income above the minimum wage.

Table 2. Distribution of Factors Determining Sleep Quality in Hypertension Patients

Determining Factor	**N**	%
Stress		
Mid Stress	48	70,6
Moderate Stress	20	29,4
Smoking Habit		
Yes	6	8,8
No	62	91,2
Smoking Frequency		
Always (everyday)	5	83,3
Almost Never (1-2 Day/week)	1	16,7
Antidepressant Drug Consumption	0	0

The results in Table 2 indicate that the majority of respondents fall into the mild stress category, with a percentage of 70.6%. Meanwhile, 29.4% of respondents were recorded in the moderate stress category. No respondents were found in the severe stress category, indicating that the stress level experienced by most respondents is still in the mild to moderate range.Regarding the smoking habit variable, it was found that only 6 respondents (8.8%) had a smoking habit. Conversely, the majority of respondents did not have a smoking habit. This result provides an overview that smoking behavior is not dominant among the respondent group. Among the six respondents who had a smoking habit, the majority, i.e., 5 people (83.3%), were found to smoke daily. Only 1 person (16.7%) was recorded to smoke 1–2 times per week. This data shows that smokers in the study tend to have a high smoking intensity.

Furthermore, all respondents in this study (100%) were reported not to consume antidepressant medication. This means that there was no use of antidepressant drugs among the respondent group being studied. This condition indicates that although there were respondents experiencing mild to moderate stress, they had not yet required pharmacological treatment.

Table 3. Distribution of Respondents Based on Sleep Quality

Sleep Quality	**n**	%
Sleep quality good	23	33,8
Sleep quality bad	45	66,2
Total	68	100,0

Table 3 shows that 23 respondents, or 33.8%, have good sleep quality. The group with poor sleep quality consists of 45 respondents, or 66.2%. It can be seen from the distribution table that most hypertension patients at Tuminting Health Center have poor sleep quality.

Table 4. Cross-Tabulation Between Determining Factors and Sleep Quality

Characteristics/Variables	**Sleep Quality**	
	Good (%)	**bad (%)**
Age		
19-44 year	3 (75,0)	1 (25,0)
45-59 year	7 (23,3)	23 (76,7)
>60 year	13 (38,2)	21 (61,8)
gender		
male	3 (20,0)	12 (80,0)
Female	20 (37,7)	33 (62,3)
Livelihood		
There	7 (24,1)	22 (75,9)
Nothing	16 (41,0)	23 (59,0)
Income		
Under UMK	18 (36,0)	32 (64,0)
Up UMK	5 (27,8)	13 (72,2)

Stress		
Mid Stress	19 (39,6)	29 (60,4)
Moderate Stress	4 (20,0)	16 (80,0)
Smoking Habit		
yes	0 (0)	6 (100)
No	23 (37,1)	39 (62,9)
Antidepressant Drug Consumption	0 (0)	0 (0)

From the cross-tabulation in Table 4, it shows the distribution of determining factors for sleep quality among hypertension patients at Tuminting Health Center. In the 19–44 age group, there were 3 respondents with good sleep quality and 1 respondent with poor sleep quality. In the 45–59 age group, the majority of respondents had poor sleep quality, with only 7 respondents having good sleep quality. Meanwhile, in the age group over 60 years, poor sleep quality also predominated with 21 respondents, while 13 respondents had good sleep quality. Based on gender, male respondents, totaling 12 people (80.0%), had poor sleep quality and only 3 people (20.0%) had good sleep quality. In contrast, among female respondents, 33 people (62.3%) experienced poor sleep quality, and 20 people (37.7%) had good sleep quality.

The characteristics of livelihood indicate that respondents without a livelihood, totaling 23 respondents (59.0%), experienced poor sleep quality, while 16 respondents (41.0%) had good sleep quality. Among respondents with a livelihood, 22 individuals (75.9%) had poor sleep quality, and only 7 individuals (24.1%) had good sleep quality. Distribution based on income shows that among respondents with income below the minimum wage (UMK), 32 individuals (64.0%) had poor sleep quality, while 18 individuals (36.0%) had good sleep quality. Meanwhile, among respondents with income above the minimum wage, 13 individuals (72.2%) experienced poor sleep quality, and only 5 individuals (27.8%) had good sleep quality.

In the group with mild stress, 29 respondents (60.4%) had poor sleep quality and 19 respondents (39.6%) had good sleep quality. Meanwhile, in the group with moderate stress, 16 respondents (80.8%) had poor sleep quality and only 4 respondents (20.0%) had good sleep quality. Regarding the smoking habit variable, all respondents who smoked experienced poor sleep quality (100%), while in the non-smoking group, there were 39 respondents (62.9%) with poor sleep quality and 23 respondents (37.1%) with good sleep quality. All respondents were recorded as not taking antidepressant medication.

DISCUSSION

Age

The quality of sleep in hypertension patients in this study varied according to age group. Respondents aged 19–44 years mostly had good sleep quality. Whereas in the 45–50 age group, the majority of respondents, 76.7%, had poor sleep quality. A similar finding was also observed in the ≥60 age group, where 61.8% of respondents also had poor sleep quality. Based on these results,

it can be said that the majority of respondents over 45 years old have poor sleep quality.

Physiologically, this can be explained through biological changes that occur throughout the aging process. Between the ages of 45–59, hormonal changes occur, particularly in women entering the menopause period, with a decrease in estrogen levels that can affect sleep quality (Monterrosa-Castro et al., 2024). In addition, in elderly individuals, there is a decline in sleep homeostasis function, changes in sleep patterns, such as lighter sleep phases, and an increased risk of comorbidities that can impact sleep disturbances (Taillard et al., 2021).

Sleep disturbances in older adults are often triggered by external factors such as waking up at night due to sudden loud noises, needing to use the bathroom, feeling cold, and most significantly, pain or discomfort in certain parts of the body that disrupt their sleep comfort (Moreno, C.R.C et al., 2019). These factors cause the elderly to wake up more frequently at night. This problem arises as age increases Physical changes occur. The decline in physical condition and health contributes to poor sleep quality in the elderly (Ningtyas, 2024).

This observation shows that as age increases, particularly after 45 years, the sleep quality of respondents with hypertension tends to decrease, determined by physiological factors as well as health conditions associated with the aging process. This is in line with literature that finds that as age increases, a person's sleep duration tends to decrease, indicating that age has an impact on sleep quality (Leba, Maria, and Harningtyas, 2023)..

Gender

Poor sleep quality based on the results of this study was dominated by male respondents (80.0%) compared to females (62.3%). Conversely, good sleep quality was found among female respondents (37.7%) compared to males (20.0%). These results indicate that men have poorer sleep quality compared to women. This is in line with previous research showing that gender factors determine sleep quality in the hypertensive population (Li et al., 2020). Another study conducted by Harisa et al. (2022) found that poor sleep quality was dominated by male respondents.

Physiologically, this difference can be explained through hormonal and neuroendocrine factors. Women have estrogen and progesterone, which act as protective agents for sleep quality, especially before menopause (Dorsey, de Lecea and Jennings, 2021). Estrogen is known to increase serotonin production, which is then converted into melatonin, the hormone that regulates sleep. In addition, progesterone has a sedative effect that can help improve sleep quality. This explains why, in the productive age group, women tend to have better sleep quality compared to men (Tandon et al., 2022). However, this condition can change during the menopause phase, where women experience a decrease in estrogen levels that triggers sleep disturbances (Widjayanti, 2018). Therefore, gender is not only determined by biological factors alone but also by age. In this study, middle-aged women (45–59 years) were actually more vulnerable to experiencing quality Poor sleep compared to young women. Thus, the results of this study indicate that men tend to have poorer sleep quality. This difference is

not only determined by biological factors such as hormones and neuroendocrine function but also by age stages, particularly in women entering menopause.

Occupation

The study results show that most respondents with poor sleep quality come from the group with an occupation. Conversely, respondents without an occupation have a higher proportion of good sleep quality (41.0%) compared to the group with an occupation. This study indicates that the group without an occupation has good sleep quality.

This condition can be caused by longer and more flexible rest periods, as well as lower exposure to workload and stress compared to the working group. Certain types of occupations, especially those involving physical strain or high responsibility, can increase stress levels and disrupt sleep rhythms. Work pressure, irregular working hours, and high job demands are factors that can trigger excessive activation of the sympathetic nervous system, thereby disturbing sleep (Jeon and Kim, 2022).

Thus, this study indicates that having an occupation can be a contributing factor to sleep quality in individuals with hypertension, whether through mechanisms of work stress, physical and mental workload, or disruptions to the circadian rhythm due to irregular work patterns. This is consistent with the findings of Gou, Zhong, and Jiao (2023), which show that occupation and socio-economic status determine sleep quality in the hypertensive population. Therefore, occupation is an important factor that needs to be considered in efforts to improve sleep quality in individuals with hypertension.

Income

The research results indicate that out of the total respondents, the majority of hypertension patients with an income above the 2025 City Minimum Wage (UMK) have poor sleep quality (72.2%). Meanwhile, the group with income below the UMK has poor sleep quality, with only 5 respondents having good sleep quality. On the other hand, good sleep quality is more commonly found in the group with income below the UMK. A total of 18 respondents (36.0%) in this group have good sleep quality, compared to only 5 respondents (27.8%) in the group with income above the UMK. This indicates that respondents with income above the UMK have poorer sleep quality compared to those with income below the UMK.

This is in contrast with a study by Liu et al. (2025), which stated that low income negatively affects sleep quality. Another study by Chen et al. (2020) also found that individuals with low economic status tend to have abnormal sleep duration. However, the results of this study indicate that poor sleep quality in the group with income above the minimum wage is likely because some members of this group have occupations related to higher workloads, which interfere with the relaxation process. This is supported by research by Hamel, Rompas, and Doda (2019), which found that workload, length of employment, and work shifts have a significant impact on sleep pattern disturbances. This strengthens the assumption that work-related burden is an important factor affecting sleep quality, including in individuals with hypertension.

The findings of this study indicate that income is not always linearly related to sleep quality, but rather is determined by various factors such as workload. Therefore, it is important to consider aspects of work, stress management, and healthy lifestyle patterns in efforts to improve both sleep quality and the quality of life of individuals with hypertension.

Stress

This study shows that the majority of respondents with poor sleep quality were in the category of mild or moderate stress. Among the mild stress group, 60.4% of respondents experienced poor sleep quality, whereas 39.6% had good sleep quality. Meanwhile, in the moderate stress group, the proportion of poor sleep quality increased to 80.0%, with only 20.0% of respondents having good sleep quality. This illustrates that the higher the level of stress, the greater the likelihood that a person will experience poor sleep quality.

These results are in line with the research by Nuraeni, Ramadhani, and Chaerani (2024), which found that 87% of individuals with moderate stress have poor sleep quality and 50% of those with mild stress have poor sleep quality. This is further supported by Chen et al. (2023), who asserted that the higher the stress level, the lower the sleep quality experienced by individuals. Physiologically, stress triggers the activation of the sympathetic nervous system, causing increased heart rate, muscle tension, and heightened alertness, making it difficult for the body to enter deep sleep phases (Greenlund and Carter, 2022). Additionally, individuals with high psychological stress levels tend to have difficulty sleeping, often waking up during the night due to excessive activation of the sympathetic nervous system during stress, thereby hindering the body's ability to relax and sleep deeply (Zhang et al., 2022).

The depiction of this study shows that poor sleep quality is more commonly experienced by respondents with mild to moderate stress levels. The higher the stress level, the greater the proportion of respondents experiencing sleep disturbances, indicating that stress appears as a prominent factor in this study. This demonstrates that stress is one of the key factors in the study, where poor sleep quality is more frequently found among respondents with higher stress levels.

Smoking Habits

According to the study results, all respondents who smoke (100%) have poor sleep quality, whereas in the non-smoking group, only 62.9% experienced poor sleep quality and 37.1% had good sleep quality. This indicates that all respondents with a smoking habit have poor sleep quality.

These results are in line with the research by Sun and Li (2024) which found that smokers have a risk of sleep disturbances. Another study by Supit, Langi, and Wariki (2018) found that smokers have nearly three times the risk of experiencing poor sleep quality. It was also found that smoking can alter a person's sleep patterns, particularly by reducing the deepest stages of sleep (slow wave sleep) and the REM sleep phase, which play important roles in recovery and sleep quality (Truong et al., 2021). The findings of this study show that respondents who smoke regularly entirely experience poor sleep quality. This

trend aligns with previous theories and studies that emphasize the negative impact of smoking on sleep patterns.

Antidepressant Consumption

The results of this study indicate that none of the respondents consumed antidepressant drugs, so the variable of antidepressant drug consumption cannot be analyzed in relation to sleep quality in hypertensive patients at Tuminting Health Center, because all respondents had no history of using these drugs. The absence of respondents using antidepressants in this study may be due to hypertensive patients mostly receiving routine antihypertensive therapy through the Prolanis program, which functions to manage hypertension more comprehensively. Although no respondents used antidepressant drugs, previous studies have shown a correlation between this type of drug and sleep quality. Riemann et al. (2020) found that certain types of antidepressants, such as selective serotonin reuptake inhibitors (SSRIs), can worsen sleep quality by triggering insomnia in some patients. Pharmacologically, certain antidepressants work by altering levels of serotonin neurotransmitter, which is associated with mood regulaion as well as the sleep cycle.

Sleep Quality

Data collected at Tuminting Health Center showed that out of 68 respondents with a history of hypertension, 23 respondents had good sleep quality. Meanwhile, the other 45 respondents were recorded as having poor sleep quality. The proportion of respondents with poor sleep quality was higher compared to those with good sleep quality. This indicates that sleep disturbances are a problem among hypertension patients in the working area of Tuminting Health Center.

These results are in line with the research of Sakinah, Kosasih, and Sari (2018), who found that 94.9% of hypertension patients have poor sleep quality. Similar results were also shown by Birhanu et al. (2021), who found that most hypertension patients experience sleep disturbances. In addition, Li et al. (2020) explained that hypertension patients are two to three times more likely to experience sleep quality disturbances compared to the general population. The description of this study indicates that poor sleep quality is a dominant condition among hypertension patients. These results are consistent with previous theories and research, which assert that hypertension is closely related to decreased sleep quality. Therefore, sleep quality should be considered an important aspect in the health management of hypertension patients.

CONCLUSIONS AND RECOMMENDATIONS

The research results obtained by researchers regarding the description of the determining factors of sleep quality in hypertension patients at Tuminting Health Center in Manado City can be concluded that the majority of hypertension patients at Tuminting Health Center experience poor sleep quality, which is primarily determined by factors such as age, gender, occupation, income, stress, and smoking habits.

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