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Research Article

The Relationship Between Blood Pressure Increase and Sleep Quality of Hypertension Sufferer in Lebaksitu Village

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Abstract

Aims: To determine the relationship between increased blood pressure and changes in sleep quality in hypertension sufferers.
Method: The study design used a correlational approach with a cross-sectional method. The number of samples was 66 respondents using a purposive sampling technique. Data collection techniques used a sleep quality questionnaire and standardized manual blood pressure measuring instrument. Data processing included editing, coding, entry and cleaning with the SPSS application to analyze univariate and bivariate.
Results: this study showed that the majority of blood pressure in hypertension sufferers was in the grade I category of 45.6% with poor sleep quality of 81.8%. The results of this study also showed a significant relationship between increased blood pressure and sleep quality in hypertension sufferers with a significance value of 0.028 (<0.05).
Conclusion: Increased blood pressure causes headache symptoms in hypertension sufferers which disrupts the sleep cycle and worsens the quality of sleep in hypertension sufferers.

Keywords:
Cardiovascular Disease, Hypertension, Nighttime Awakenings, Systolic elevation, Sleep Abnormal

INTRODUCTION

Hypertension, or high blood pressure, is one of the non-communicable diseases that causes increased morbidity and mortality worldwide. For someone who suffers from hypertension, controlling blood pressure is a top priority to obtain optimal health and well-being (1). A person can be said to have hypertension if they have systolic blood pressure of more than 140 mmHg and diastolic blood pressure of more than 90 mmHg. The first time someone experiences hypertension often does not give signs and symptoms to the sufferer, so it can cause various damage to body organs if not detected and treated too late (2). WHO (2023) reports that there are 1.28 billion adults aged 30 to 79 years worldwide who are diagnosed with hypertension, with cases of hypertension being found in low- and middle-income countries. The Ministry of Health of the Republic of Indonesia in the 2018 RISKESDAS national report said that there was an increase in hypertension cases from 25.8% to 34.1% (4). The increase in hypertension cases is also felt in every province, one of which is West Java province, which also experienced an increase from 2013 by 34.5% to 39.6% in 2018 (5). This increase in hypertension is related to lifestyle, including smoking habits, lack of knowledge about diet, lack of physical activity, and lack of consumption of

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fruits and vegetables (6). The WHO report states that the possibility of an increase in cardiovascular disease in 2030 reaches 24% (7). The prevalence of hypertension cases over the age of 20 reaches a death rate of 74.5 million people, and around 90%-95% of hypertension cases have no known cause in the United States (8). Hypertension often does not cause any particular symptoms in sufferers, so many sufferers of hypertension only realize that they have the disease when it has caused various symptoms, one of which is a headache (9). Physical disturbances experienced during sleep cause physical discomfort that results in sleep disorders, such as reduced number of hours of sleep, increased frequency of awakening, NREM and REM cycle disorders, and feeling tired when waking up in the morning (10) (11). These sleep disorders will affect poor sleep quality, thus becoming one of the factors causing increased blood pressure (12). Sleep has benefits in suppressing blood pressure by reducing catecholamine secretion. In addition, increased sympathetic nerve activity in blood vessels is closely related to sleep quality, where a person will experience insignificant changes in cardiac output at night (1). Based on a report from the Lebakgedong Health Center, data was obtained that hypertension sufferers continue to increase. In 2020, there were 500 people with hypertension, in 2021 it increased to 545 people and in 2022 there was a significant increase reaching 850 people with an age range of 15-62 years.

METHODS

This study is a quantitative analytical research employing a cross-sectional approach, conducted between February and August 2023. The primary focus is to investigate the relationship between increased blood pressure (independent variable) and sleep quality (dependent variable) among individuals with hypertension.

Study Design

The cross-sectional design allows for the examination of the relationship between blood pressure and sleep quality at a single point in time. This approach is particularly useful for identifying potential associations and prevalence within a defined population.

Sample

The sample comprised 66 individuals diagnosed with hypertension residing in Lebaksitu Village, Cisarua District. Participants were selected using purposive sampling, which targeted individuals who met specific criteria. The inclusion criteria required participants to be hypertension sufferers diagnosed for at least one month and receiving either monotherapy or combination therapy. Exclusion criteria involved individuals with limitations in reading and writing, ensuring that all participants could adequately understand and respond to the questionnaire.

Instrument

The study utilized the Sleep Quality Questionnaire (SQQ), designed to assess various dimensions of sleep quality over the preceding 24 hours. The questionnaire focuses on four key aspects: sleep latency (time taken to fall asleep), sleep duration (total sleep time), sleep depth (perceived quality of sleep), and frequency of waking up at night. The SQQ features closed-ended questions, allowing for straightforward responses that facilitate quantitative analysis. Additionally, blood pressure was measured using a standardized manual tensiometer to ensure accuracy and reliability.

Data Collection

Data collection involved administering the SQQ to participants to gather information about their sleep quality. Simultaneously, blood pressure measurements were taken to obtain relevant physiological data. Researchers ensured that participants understood the purpose of the study and the importance of providing accurate responses.

Data Analysis

The data processing involved several steps: editing to correct any inconsistencies,

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coding to categorize responses, data entry into a statistical software system, and tabulation for easy interpretation. The analysis included univariate frequency distribution to describe the characteristics of the sample and bivariate chi-square analysis to examine the relationship between increased blood pressure and sleep quality. This statistical approach allowed the researchers to identify potential associations and draw conclusions regarding the impact of hypertension on sleep quality.

RESULTS

1. Age

Table 1.1 Frequency Distribution Based on Age

Age	Frequency	Percentage (%)
Teenagers	6	9.1
Adult	46	69.7
Elderly	14	21.2
Total	**66**	**100**

In Table 1.1, the frequency distribution of data shows that the majority of respondents have an adult age level of 69.7%, and an elderly age level of 21.2%.

2. Gender

Table 1.2 Frequency distribution by gender

Gender	Frequency	Percentage (%)
Male	18	27.3
Female	48	72.7
Total	66	100

In table 1.2, the respondents in this study were mostly women at 72.7%.

3. Education

Table 1.3 Frequency distribution based on education level

Education	Frequency	Percentage (%)
Elemantry School	43	65.2
Junior High School	11	16.7
Senior High School	3	4.5
Higher Education	9	13.6
Total	**66**	**100**

In Table 1.3, the frequency distribution of education data shows that the majority of respondents are at elementary school level, namely 65.2%, and at tertiary level, namely 13.6%.

4. Blood Pressure

Table 1.4 Frequency distribution based on Respondents Blood Pressure

Blood Pressure	Frequency	Percentage (%)

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Normal (100-139 mmHg)	18	27.2
Hipertension Grade I (140-159 mmHg)	30	45.6
Hipertension Grade II (>160 mmHg)	18	27.2
Total	**66**	**100**

In table 1.4, respondents' blood pressure is dominated by the pre-hypertension category at 45.6% and hypertension at 27.2%.

5. Sleep Quality

Table 1.5 Frequency Distribution Based on Respondents Sleep Quality

Sleep Quality	Frequency	Percentage (%)
Good	12	18.2
Bad	54	81.8
Total	**66**	**100**

In table 1.5, respondents who have sleep quality in the poor category are 81.8%.

Bivariate Analysis Results

Table 1.6 The relationship between blood pressure and sleep quality

Blood Pressure	Sleep Quality				Total		*P Value*
	Good		Bad				
	F	%	F	%	N	%	
Normal	7	10.6	11	16.7	18	27.3	**0,028**
HT Grade I	3	4.5	27	41	30	45.5	
HT Grade II	2	3	16	24.2	18	27.2	
Jumlah	**12**	**18.1**	**54**	**81.9**	**66**	**100**	

Based on the chi-square test with α = 0.05 (5%) between sleep quality and changes in blood pressure in the Lebakgedong Health Center Work Area, it has a significant value of ρ of 0.028 (ρ < 0.05), so H0 is rejected, meaning that there is a significant relationship between sleep quality and changes in blood pressure.

DISCUSSION

Hypertension is the most common health problem in the Bogor Health Center and Bogor Regency areas. In the Bogor City Health Service report in 2022, there was an increase in hypertension sufferers in the community of 63,579 cases, while in 2021 there were only 56,411 cases. Hypertension can occur in both men and women, in the Bogor City Health Service report there were 33,822 female sufferers, and 29,757 male sufferers (5). The same thing was also found in this study, 72.7% of women experienced hypertension in the Lebaksitu Village area RW 001. Gender has a significant influence on the incidence of hypertension. Women are at high risk of experiencing hypertension caused by menopause (13). Menopause is caused by changes in the hormones estrogen, and progesterone, where the hormone estrogen is very important for maintaining body function, and blood vessel health (14). In addition, several hormones during menopause have an effect on increasing blood pressure such as increased androgen capacity, and endothelial plasma levels, activation of the renin-angiotensin system,

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and increased insulin hormone resistance (15). Menopause is not the main factor influencing the emergence of cardiovascular disease or hypertension in women, but lifestyle, medical, and genetic factors are also involved in increasing cases of cardiovascular disease in women (16). According to the researcher's assumption, the risk factors for hypertension are not only due to hormonal changes in women, but a poor lifestyle can be a factor in the occurrence of hypertension in a person.

Hypertension also often occurs in the elderly, age is a risk factor that everyone has, and is a risk factor for hypertension that cannot be controlled. The results of the univariate analysis showed that respondents aged over 26 years who were at risk of hypertension were 69.7% and over 60 years were 21.2%. The results of the univariate analysis showed that those over 26 years of age had experienced hypertension by 69.7%. In addition, cases of hypertension were also found in those over 60 years of age by 21.2%. The increased risk of hypertension often occurs in those over 40 years of age due to changes in the structure of large blood vessels, so that the lumen becomes narrower and the walls of the blood vessels become stiff, resulting in an increase in systolic blood pressure (17). This study is in line with Ariyani (2020) who said that respondents aged 55-65 years were 0.592 times more likely to develop hypertension compared to respondents aged less than 45 years. According to the researcher's analysis, adulthood is a risk group that is susceptible to hypertension and hypertension increases with age.

Increasing age can increase the risk of changes in the arterial blood vessels in the body to become wider and stiffer, resulting in capacity and decline in blood vessel function (19). As a result, systolic blood pressure increases above normal. This age factor also causes changes in neurohormonal mechanisms, such as the renin-angiotensin-aldosterone system and also increases in peripheral plasma concentrations and intestinal fibrosis, so that blood pressure also increases (20). In this study, the average education of hypertension sufferers was elementary school education of 65.2%. The education of hypertension sufferers will have an impact on the ability to understand and apply a healthy lifestyle as a form of blood pressure control (17). In the Southeast Medan area, it was found that the average education of the community was only high school graduates, who did not have knowledge related to healthy living behaviors, and how to process low-salt foods to prevent increased blood pressure (21). Not only higher education can influence someone to have good knowledge, but from the experience gained, someone can become basic knowledge and increase understanding in controlling blood pressure in everyday life.

The results of the bivariate analysis in this study using the chi square analysis test showed a relationship between the sleep quality of hypertension sufferer and changes in blood pressure with a significant value of 0.028 (<0.05). Alfi & Yuliwar's study stated that someone who has poor sleep quality can affect blood pressure, which is caused by various factors such as diseases that cause pain, causing disturbances and reduced sleep duration (22). This study is in line with Melizza et al. which revealed that there is a relationship between sleep quality and pressure in the elderly at the elderly posyandu Dusun Jelapan Sindumartani Ngeplak Sleman Yogyakarta obtained with a significant value of 0.049 (23).

Sleep quality disorders have various adverse effects that can occur in the short or long term. Luh et al. revealed that someone who has sleep quality disorders tends to have high blood pressure (24). BP will decrease when sleeping in normal conditions (around 10-20%) is still considered normal compared to when we are conscious, this can be related to decreased sympathetic activity in the state when we sleep (25). Poor sleep quality in the long term can increase body mass index

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and depression in adults (26). In fact, each individual has a daily sleep requirement based on age. People who are in adulthood have a sleep requirement of between 7-8 hours per day which is highly recommended to be implemented (6). In addition, in the study of Liu et al. also said that most sleep disorders are experienced by people with hypertension compared to someone who has normal blood pressure, this is influenced when sleep occurs an increase in sympathetic nerve activity to the blood vessels which increases the heart rate and blood pressure (11). In addition, abnormal sleep problems and sleep habits can cause physical and psychosocial stress and increased sympathetic nerve activity which can also increase heart rate and blood pressure as well as salt retention which results in hypertension (27)

CONCLUSION

This study revealed a relationship between increased blood pressure that has an impact on poor sleep quality in hypertension sufferers in Lebaksitu Village, Sukamanah District, with a significance value of 0.028. Hypertension sufferers in this study were in the category of grade I and II hypertension of 45.6% and 27.2%. Hypertension sufferers who are unable to control their blood pressure do not have good sleep quality. One of the symptoms that arise when blood pressure increases is physical discomfort such as headaches and frequent urination. As a result, sufferers find it difficult to start sleeping at night and increase the frequency of waking up due to urination, resulting in reduced sleep duration from needs and poor sleep quality. The importance of awareness of hypertension sufferers in maintaining stable blood pressure by limiting salt consumption, routinely controlling blood pressure at health care facilities, and not stopping taking antihypertensive drugs without the advice of health workers. Hypertension sufferers who are able to control blood pressure within the normal range will have optimal sleep quality. Good sleep quality will improve aspects of physical health, energy, mental health, memory and concentration.

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