(Frits Reinier Wantian Suling) Relationship between Sleep Quality and Blood Pressure of the Indonesian Christian University Security Officer Unit in 2022

by Sari Mentari Simanjuntak

Submission date: 01-Dec-2023 08:46AM (UTC+0700)
Submission ID: 2242657888
File name: ndonesian_Christian_University_Security_Officer_Unit_in_2022.pdf (453.17K)
Word count: 6299
Character count: 34027

Available online on 15.11.2023 at http://jddtonline.info

Journal of Drug Delivery and Therapeutics

Open Access to Pharmaceutical and Medical Research

Open Access Full Text Article

Research Article

Relationship between Sleep Quality and Blood Pressure of the Indonesian Christian University Security Officer Unit in 2022

Frits Reinier Wantian Suling[1]*, Frisca Ronauli Batubara[2]

[1]Division of Cardiology Medicine, Department of Internal Medicine, Faculty of Medicine, Universitas Kristen Indonesia

[2]Department of Physiology, Faculty of Medicine, Universitas Kristen Indonesia

Article Info:

Article History:

Received 05 Sep 2023
Reviewed 16 Oct 2023
Accepted 04 Nov 2023
Published 15 Nov 2023

Cite this article as:

Suling FRW, Batubara FR, Relationship between Sleep Quality and Blood Pressure of the Indonesian Christian University Security Officer Unit in 2022, Journal of Drug Delivery and Therapeutics. 2023; 13(11):136-143

DOI: http://dx.doi.org/10.22270/jddt.v13i11.6031

*Address for Correspondence:

Frits Reinier Wantian Suling, Division of Cardiology Medicine, Department of Internal Medicine, Faculty of Medicine, Universitas Kristen Indonesia

Abstract

Blood pressure is the primary arterial pressure in the systemic circulation measured in millimeters of mercury. Blood pressure is divided into systolic blood pressure and diastolic blood pressure. Blood pressure is very volatile and is affected by many activities. One factor affecting blood pressure is sleep quality; several population-based cohort studies say poor sleep quality can increase blood pressure. This study aimed to determine the relationship between sleep quality and blood pressure in the security guard unit (SATPAM) in the Indonesian Christian University area. The method used is *an analytical observational* and uses a *cross-sectional*. The data collection technique used primary data obtained through blood pressure measurements at the Security Officer Unit and a questionnaire from July 18 - July 23, 2022, and obtained a sample of 54 respondents. The results showed that most respondents were aged 26-35 years (40.7%), most respondents were male (96.3%), and respondents with poor sleep quality were 39 people (72.7%). Statistical test *Pearson Correlation* showed no correlation between sleep quality and systolic and diastolic blood pressure at night or in the morning (p>0.05). This study concludes that there is no correlation between sleep quality and blood pressure of the Indonesian Christian University Security Officer Unit.

Keywords: Sleep Quality, Blood Pressure, Security Officer Unit

INTRODUCTION

Blood pressure is the primary arterial pressure in the systemic circulation measured in millimeters of mercury. Blood pressure is divided into systolic blood pressure and diastolic blood pressure. Systolic blood pressure refers to the maximum pressure in the arteries when the heart muscle contracts to push blood throughout the body, while diastolic blood pressure describes the lowest pressure in the arteries during heart muscle relaxation. [1] Blood pressure changes very easily and is influenced by many activities. Sleep quality influences blood pressure; several population-based cohort studies say that poor sleep quality can increase blood pressure. Poor sleep quality includes short sleep duration and breathing problems during sleep. [2] Sleep duration is related to age. Babies' sleep duration is around 16-20 hours per day, children 10-12 hours, mid-adolescence decreases to 9-10 hours, adults around 7-7.5 hours, and elderly individuals around 6.5 hours per day. However, sleep duration is also influenced by genetic factors, physical activity, and a person's psychological status. [3] Night shift workers face an increased risk of cardiovascular disease compared to day workers. [4] The risk of cardiovascular disease is 17% higher among night shift workers than day workers, and the risk of myocardial infarction is 23% higher among night shift workers than those working daytime hours. [5] The biggest effect of night shift workers is disruption of circadian rhythms due to lack of sleep, which is associated with increased blood pressure due to activation of the sympathetic nervous system. [6]

According to the State Police Regulation of the Republic of Indonesia Number 4 of 2020 concerning Independent Security, the Security Unit or what is known as SATPAM is a professional unit or group carrying out limited non-judicial police functions which is formed through recruitment by security service business entities or security guard service users to carry out security in carrying out security in the work environment. Security guard members are security officers recruited trained, and have membership cards and employment status following statutory provisions. [7] Company and Legal Entity Leaders regulate working hours, including rest time for each Security Guard Workforce within the Company and other Legal Entities, into three shifts where each shift works eight hours a day. According to the Joint Decree of the Minister of Manpower of the Republic of Indonesia and the Chief of Police of the Republic of Indonesia Number KEP. 275/Men/1989 and No.POL Kep/04/V/1989 in point one states that the working hours for security guards in a company and other legal entities are 8 hours, including daily rest time. The second point states that working hours, including rest hours, are not more than 40 per week cumulatively. [8] Research conducted by Wahid et al. shows that respondents with poor sleep quality will affect blood

pressure. [3] Based on the above background, researchers are interested in knowing the relationship between sleep quality and blood pressure at the Indonesian Christian University Security Officer Unit. The problem formulation in this research is whether there is a relationship between sleep quality and blood pressure in the security officer unit (SATPAM) in the Indonesian Christian University area. The research aims to determine the relationship between sleep quality and blood pressure in the security officer unit (SATPAM) in the Indonesian Christian University area.

LITERATURE REVIEW

Blood pressure (BP) is a physiological parameter characterized by continuous dynamic fluctuations that occur over timescales ranging from seconds to years. These fluctuations are the result of a complex interaction between environmental (e.g., season, altitude, stress), physical (posture or body fluid volume), and emotional factors that drive changes in blood pressure and cardiovascular regulatory mechanisms aimed at maintaining the so-called " blood pressure homeostasis." This mechanism is intended to ensure constant adequate organ perfusion capable of modifying BP levels in response to changing demands on different organs (e.g., increased BP in the face of physical or emotional stress and reduced BP during sleep). [9]

Blood pressure classification based on Joint National Committee VII (JNC VII), is divided into several categories, namely: [9]

Table 1: Classification and Management of Blood Pressure For Adults

BP Classification	SBP* mmHg	DBP* mmHg	Lifestyle Modification	Initial drug therapy	
				Without Compelling Indication	With Compelling Indications (See Table 8)
Normal	<120	and <80	Encourage		
Prehypertension	120–139	or 80–89	Yes	No antihypertensive drug indicated.	Drug(s) for compelling indications.‡
Stage 1 Hypertension	140–159	or 90–99	Yes	Thiazide-type diuretics for most. May consider ACEI, ARB, BB, CCB, or combination.	Drug(s) for the compelling indications.‡ Other antihypertensive drugs (diuretics, ACEI, ARB, BB, CCB) as needed.
Stage 2 Hypertension	≥160	or ≥100	Yes	Two-drug combination for most† (usually thiazide-type diuretic and ACEI or ARB or BB or CCB).	

Hypotension is classified based on biometric parameters from blood pressure measurements. Systolic blood pressure is less than 90 mmHg, mean arterial pressure is less than 65 mmHg, and diastolic blood pressure is less than 40 mmHg. Orthostatic hypotension with a decrease in systolic pressure of 20 mmHg or greater or a decrease in diastolic pressure of 10 mmHg or greater on a change in position from lying to standing. [10]

Blood pressure is defined as Blood Pressure = Cardiac output x Total peripheral vascular resistance. Mean arterial pressure is the average blood pressure during one cardiac cycle. It is calculated as Mean arterial pressure = 2/3 diastolic pressure + 1/3 systolic pressure. [10] Blood pressure describes the interrelation of cardiac output, blood volume, peripheral vascular resistance, arterial elasticity, and blood viscosity. [10]

Cardiac output is the volume of blood pumped by each ventricle per minute (not the total amount of blood pumped by the heart). Over some time, the volume of blood flowing through the pulmonary circulation is equal to the volume flowing through the systemic circulation. Generally, the cardiac output of each ventricle is the same, although sometimes there are slight variations between one beat and another. The sum of all local blood flow greatly influences cardiac output. Blood that flows from the arteries to the tissues will immediately return to the heart with the help of the veins. So, the heart works automatically by responding to tissue needs. However, the heart often needs help in the form of special nerve signals to pump blood according to the amount of blood flow required. Cardiac output is also influenced by heart speed (beats per minute) and stroke volume (blood pumped per beat). Cardiac output influences mean arterial blood pressure. [10, 11] The extracellular volume that affects blood pressure is the blood volume in the body. When blood volume increases, the average circulating filling pressure will be affected, which has a major impact on increasing venous blood return to the heart. Venous blood flow to the heart increases cardiac output, which has an impact on blood pressure. Massive loss of blood volume causes blood pressure to drop drastically. [10] A resistance that is released due to the shift of blood flowing towards a vessel is called peripheral resistance. Arterioles are where the main resistance to blood flow in the large circulation is located. The size of arteries and arterioles can change according to the conditions that influence them, such as very varied local tissue needs. [12]

All blood vessels in the circulatory system have distensibility properties. Distensibility properties can affect the blood. When blood flow increases, it is caused by increased blood pressure and reduced blood vessel distensibility. [10] Blood viscosity is the viscosity of blood as a liquid that contains many chemical elements. Hematocrit, red blood cell aggregation, and plasma viscosity play an important role in regulating blood viscosity. Increasing hematocrit will increase blood viscosity. An increase in one unit of hematocrit results in a 4% increase in blood viscosity. Continuously increasing viscosity will affect the energy expended to pump blood and affect blood pressure. When blood viscosity increases, friction will occur between the blood vessels and the blood flowing through them. The friction between blood vessels and blood flow can be expressed in a coefficient that can be measured and is called the viscosity lift coefficient. [11] Autonomic nerves greatly influence the work of

the heart and blood vessels. The sympathetic nerves will work to increase heart rate, heart muscle contraction, and vasoconstriction in blood vessels and increase heart contractility. Parasympathetic nerves work by reducing heart rate and decreasing heart muscle contractility. [10] Large systemic arteries have stretch receptors. At stretch receptors, a baroreceptor reflex mechanism occurs. The baroreceptor reflex will be sent to the central nervous system. Feedback from the central nervous system via the autonomic nerves will go to the circulation, which impacts reducing pressure in the arteries to return to normal values. [11]

The amount of fluid in the human body is regulated by a pair of organs in the retroperitoneal cavity called the kidneys. The kidneys secrete the hormone renin, which stimulates the formation of angiotensin, which affects changes in the shape of blood vessels or vasoconstriction. When vasoconstriction occurs, blood pressure increases. Sodium and water levels in the body also have an important role in regulating blood pressure values. Excessive amounts of water will cause blood pressure to increase. Meanwhile, sodium can cause vasoconstriction. Sodium and water levels are regulated through the kidneys. [11]

The factors that influence blood pressure are divided into two parts, namely: Internal factors (diurnal variations in blood pressure, sleeping and waking up, sleeping and waking up, and Valsalva maneuver) and external factors (age, gender, body position, condition), examination room, psychological condition, exercise, body mass index, and location and position when taking measurements [10, 11]

Quality sleep is a predictor of physiological and mental health and includes the overall health of the individual's body. An alternative approach to defining sleep quality involves deconstructing it into specific objective components. The word "quality" combines various valuable elements or assessment processes. [13; 14] Sleep quality can be interpreted as a subjective description and is determined by whether or not you feel energetic after waking up from sleep. Sleep quality is the achievement of each individual's satisfaction with sleep so that there is no visible feeling of tiredness, easily aroused and restless, lethargy, apathy, blackness around the eyes, swollen eyelids, red conjunctiva, sore eyes, divided attention, headaches and often yawning or feeling sleepy. Sleep quality can be seen based on seven components: a) Subjective sleep quality. Self-assessment of the quality of sleep you have, feelings of disturbance and discomfort in yourself play a role in assessing sleep quality; b) Sleep latency. The time it takes to fall asleep; c) Sleep efficiency. Obtained through the percentage of sleep needs by assessing a person's sleep hours and duration to determine whether sleep is adequate; d) Medication use. Sleeping medication can indicate how severe the sleep disturbance is; e) Sleep disorders. Disorders such as snoring, movement disorders, frequent awakenings during sleep, and nightmares can affect sleep quality; f) Sleep duration. Assessed from the time you start sleeping until the time you wake up. Unmet sleep time will result in poor sleep quality; g) Daytime dysfunction. Is a disturbance that occurs in daily activities due to feeling sleepy due to insufficient sleep; h) several factors influence sleep quality, including: a) Medicines and other substances [15]; b) Sleep patterns: c) Lifestyle; d) Living environment; e) Food and calorie intake [15;16;17]; f) Physical exercise and fatigue; g) Emotional stress [17].

Sleep Quality Measurement is carried out through a) Electroencephalogram - Electrical currents in the human brain can be recorded to determine the type of waves that appear during sleep, wakefulness, or due to other disorders. A recording is carried out on the brain's surface or the head's outer surface, which can be captured by an electroencephalogram, which will later be captured with waveforms such as alpha, beta, theta, and delta waves [16]. b) Visual Analog Scale - The visual analog scale measures the level of sleep quality using a short and effective method. The way to measure on a visual analog scale is as follows: a) The examiner makes a horizontal line ten centimeters long; b) The examiner writes contradictory statements at each end of the line, such as the best night's sleep and the worst night's sleep; c) Clients are asked to mark a dot on the line indicating their perception of sleep at night; d) The distance between the marks is measured in millimeters and given a numerical value for sleep satisfaction; e) The scale can be given repeatedly to show changes over time; and c) Pittsburgh Sleep Quality Index (PSQI) - This is an instrument discovered by Buysse and colleagues in 1998. The Pittsburgh Sleep Quality Index is used to assess an individual's level of sleep quality over one month. The aim of creating this questionnaire is: a) To provide a standardized, valid, and reliable measure of sleep quality; b) Differentiate between good and bad sleep quality; c) Provide an index that is easy to use by examination subjects and easy to interpret by doctors and researchers; d) Provides a simple and clinically useful measure of various sleep disorders that can affect sleep quality; e) In the assessment 19 questions will be assessed. PSQI has seven internal components: subjective sleep quality, duration, habitual sleep activity, sleep disorders, delayed sleep, use of sleeping pills, and daytime dysfunction. Each component is assigned a value ranging from zero to three. The total score varies from zero to twenty-one; a total PSQI score of less than five will indicate good sleep quality results; if the total PSQI score exceeds five, it will indicate poor sleep quality.

Lack of sleep can increase blood pressure, inflammation, and other stress reactions. It is caused by arterial baroreceptors working to buffer blood pressure fluctuations by receiving mechanical impulses from carotid sinus and aortic arch distension and reflexively supporting reciprocal variations of cardiovascular sympathetic outflow and consensual variations of parasympathetic outflow. In contrast, autonomic effectors generate blood pressure variations modulated by specific patterns related to daily habits such as exercise, emotions, sleep, etc. [18]

Systemic blood pressure (BP) varies with physiological states and is typically 10% to 20% lower during sleep than wakefulness. However, some individuals do not experience this BP reduction ("dip" BP) during sleep. Nocturnal blood pressure that decreases by less than 10% is defined as "non dipping." Nondipping BP is associated with a higher risk for hypertension in the normotensive population, advanced target organ damage, and poor cardiovascular prognosis among hypertensive patients. Sleep has a 'firming' effect on several physiological parameters, including the effect mentioned above of sleep on blood pressure. There is evidence that day-to-night and nocturnal regulation of BP is related to autonomic changes during the sleep-wake cycle, suggesting that BP should be particularly sensitive to disturbances that occur during sleep, especially in the presence of sympathetic nervous hyperactivation. The nervous system may occur in people with sleep deprivation. [19; 20]

Age is an individual's age, calculated from birth to birthday. Age is a limitation or level of life size that affects a person's physical condition. [21] Hurlock divides age into three periods of adulthood, namely early adulthood at the age of 18-40 years, middle adulthood at the age of 41-60 years, and old age at the age of 61 years and over. Meanwhile, according to Iswantoro and Anastasia, the following are the age categories according to the Indonesian Ministry of Health: [22; 23] a) Toddler Age: 0-5 Years - For young children, special attention will be paid, and it

will be important for them to participate in posyandu activities regularly. It aims to ensure that children's nutrition is adequate through vitamins or immunizations, which must be given; b) Childhood: 5-11 Years - The stage for children to receive basic education is 12 years of compulsory education, which has been determined by the minister of education: c) Early Adolescence: 12-16 Years - Almost the same as the age of children under them, the average age of 12-16 is still in education, which will change their mindset to the next level; d) Late Adolescence: 17-25 Years - The transition period from adolescence to adulthood is followed by the development of hormones in a person, which transforms him into a physically more mature, open-minded, and organized person; e) Early Adulthood: 26-35 Years - At this age, children must develop independently to find an identity that will determine their future. The age in this position is expected to be mature enough to face a problem; f) Late Adulthood: 36-45 Years - A person's period of good and bad times in life. Many problems arise, and how someone solves them; g) Early Elderly Period: 46-55 Years - The transition period of becoming old, decreasing the number of hormones in the body. And organ function also decreases; h) Late Old Age: 56-65 Years - The period towards old age where you have to pay attention to your psychology; the sense of sight and hearing begins to decline; and i) Older Age: > 65 Years - For the later ages, they have to pay attention to their health. With posyandu facilities for the elderly, they are hoped to be used well.

Gender is the physical and psychological characteristics that differentiate between men and women. Gender is a biological and physiological difference that can differentiate men and women. Gender refers to the biological differences between women and men; these biological differences are innate at birth and cannot be changed. According to the Central Bureau of Statistics, gender is the differentiation of roles, positions, responsibilities, and division of work between men and women determined by society based on the characteristics of women and men that are considered appropriate according to the norms, customs, beliefs, or customs of society. [24]

RESEARCH METHOD

This type of research is analytical observational and uses a cross-sectional research design that studies health phenomena that occur and analyzes the dynamics of correlation between phenomena or between risk factors and effect factors. It was done to see how far the contribution of risk factors, sleep quality, to the effect factor, namely blood pressure. The research was conducted in the Indonesian Christian University area and UKI Hospital. The research was conducted on July 18 – August 4, 2022. The research population was all security guards at the Indonesian Christian University of Cawang, totaling 54 people. The sample in this study used a total sampling technique because this study used a total population. The data collection technique in this research is primary data. Primary data was obtained using a questionnaire and measuring blood pressure in the security officer unit with a mercury sphygmomanometer and stethoscope. Data was collected by a) Visiting the security officer unit office at the Indonesian Christian University, b) Distributing questionnaires and measuring blood pressure at Indonesian Christian University security guards, and c) Analyzing the collected data. A questionnaire and a writing instrument (pen) were used to complete the questionnaire. Mercury tensiometer and stethoscope to measure blood pressure. The data collected is primary data, which can be taken directly using a questionnaire system and measuring blood pressure directly. Data processing is carried out through data editing, data coding, data processing, and data cleaning. Data obtained from collecting questionnaire answers and blood pressure measurements were converted into tabular form and then processed using the statistical software program on the SPSS version 16.0 computer. Statistical analysis to process the data obtained will use a statistical software program on a computer where two types of data analysis will be carried out, namely univariate analysis and bivariate analysis using Pearson. Before the research is carried out, all research respondents will be asked for written informed consent. The patient's identity will be kept confidential, and the researcher will be responsible for all costs related to this research.

RESULT AND DISCUSSION

Research on the relationship between sleep quality and blood pressure in the Indonesian Christian University security guard unit 2022 was conducted on fifty-four units at the Indonesian Christian University Cawang and the Indonesian Christian University Hospital, Jakarta. It uses a population that meets the minimum requirements, namely thirty samples. Furthermore, the results of the research that has been carried out will be presented below.

Table 2: Distribution of respondents according to age

Age	Total	Percentage
17-25	11	20.4
26-35	22	40.7
36-45	11	20.4
46-55	10	18.5
Total	54	100.0

Table 2 shows that the highest number of people was found, namely in the 26-35 year age range, a total of 22 people with 40.7%.

Table 3: Distribution of respondents according to gender

Gender	Total	Percentage
Male	52	96.3
Female	2	3.7
Total	54	100.0

In Table 3, it can be stated that the gender data for the security officer unit that received night watch time was found to be mostly male, numbering 52 people with a percentage of 96.3%.

Table 4: Distribution of respondents according to sleep quality

Sleep Quality	Total	Percentage
Good	15	27.8
Bad	39	72.2
Total	54	100.0

Table 4 shows that the highest sleep quality group of research respondents was poor sleep quality, 39 people (72.2%), followed by good sleep quality, 15 people (27.8%).

Table 5: Distribution of good and bad sleep quality according to age

Respondent's age	PSQI questionnaire results				Total	Percentage
	Good	%	Bad	%		
17-25 years	3	5.6	8	14.8	11	20.4
26-35 years	5	9.3	17	31.5	22	40.7
36-45 years	5	9.3	6	11.1	11	20.4
46-55 years	2	3.7	8	14.8	10	18.5
Total	15	27.8	39	72.2	54	100.0

In Table 5, it can be stated that the dominant age of the officer unit is 26-35 years old, with 17 people (31.5%) having poor sleep quality and five people (9.3%) having good sleep quality at 26-35 years old and 36-45 years old.

Table 6: Distribution of good and bad sleep quality according to gender

Gender	PSQI questionnaire results				Total	Percentage
	Good	%	Bad	%		
Male	15	27.6	37	68.5	52	96.3
Female	0	0	2	3.7	2	3.7
Total	15	27.8	39	72.2	54	100.0

In Table 6, it can be stated that the gender with the dominant sleep quality is the male gender, which has poor sleep quality in as many as 37 people (68.5%). The male gender with good sleep quality is 15 people (27.6%), while two females have poor sleep quality 3.7%.

Table 7: Average systolic and diastolic blood pressure

Blood pressure	Mean	Mode	Std. Deviation
Night systole	122.0185	125.00	11.42282
Morning systole	120.2315	120.00	12.59257
Night diastole	79.6852	80.00	5.93860
Morning diastole	78.1852	75.00	6.46274

In Table 7, it can be stated that the average systolic blood pressure at night is 122 mmHg, the average systolic blood pressure in the morning is 120 mmHg, the average diastolic blood pressure at night is 79.68 mmHg, and the average pressure morning diastolic blood is 78 mmHg.

Table 8. Results of the Pearson Correlation Statistical Test for the Relationship between Sleep Quality and Blood Pressure

Correlations		
PSQI questionnaire results	Pearson Correlation	1
	Sig. (2-tailed)	
	N	54
Night systole	Pearson Correlation	.108
	Sig. (2-tailed)	**.438**
	N	54
Morning systole	Pearson Correlation	.088
	Sig. (2-tailed)	**.528**
	N	54
Night diastole	Pearson Correlation	.106
	Sig. (2-tailed)	**.445**
	N	54
Morning diastole	Pearson Correlation	.177
	Sig. (2-tailed)	**.199**
	N	54

In Table 8, the results show no correlation between sleep quality and blood pressure in the Indonesian Christian University security officer unit because all the significance values obtained in this statistical test are > 0.05.

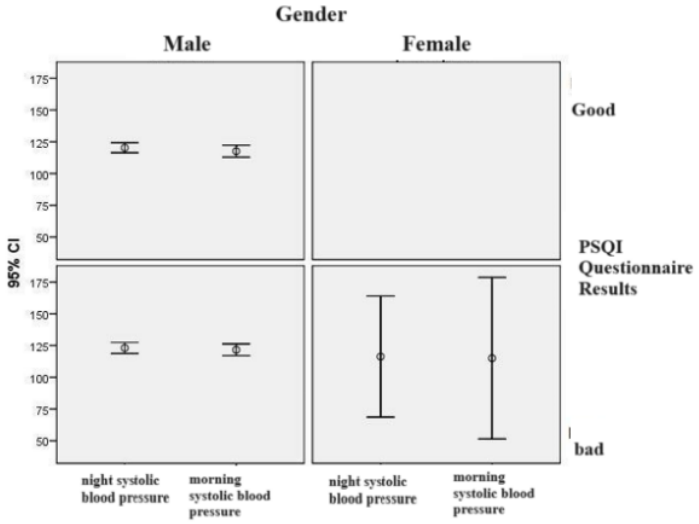

Figure 1: Blood Pressure Errorbar on Male and Female

Figure 1. Bars show that variations in blood pressure based on gender are greater in women than men. There is not much difference in night systolic blood pressure variations based on sleep quality results for men, but night systolic blood pressure is higher than morning systolic, and likewise for women.

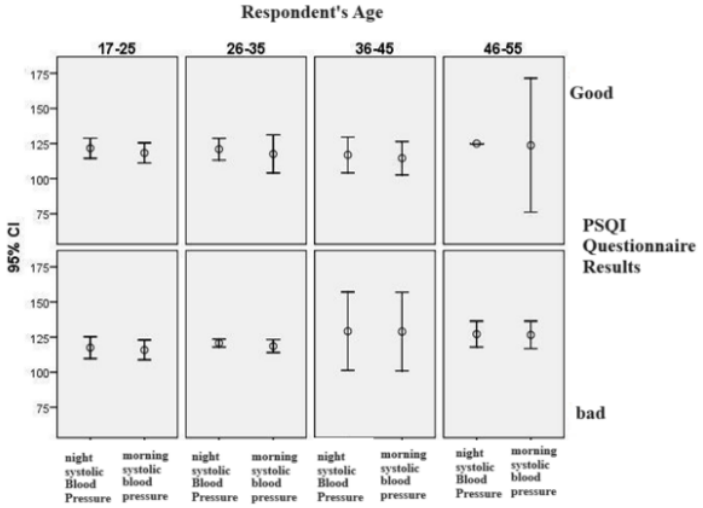

Figure 2: Blood Pressure Errorbar on Sleep Quality and Gender

In Figure 2. The Error Bar results show that the greatest variation in blood pressure occurs when the age 46-55 has good sleep quality. And blood pressure variations are greatest at 36-45 years old with poor sleep quality.

This study aims to determine the relationship between sleep quality and blood pressure in the security officer unit of the Indonesian Christian University and the General Hospital of the Indonesian Christian University, totaling fifty-four security officer units. Respondents in this study were divided into four age groups, namely 17-25 years, 26-35 years, 36-45 years, and 46-55 years. The dominant age range of respondents in this study was 26-35 years, with 22 people (40.7%). According to the Ministry of Health, this age range is included in the Early Adult age classification. Meanwhile, the minimum age range for respondents was 46-55 years, amounting to 10 people (18.5%); this classification was called the Early Elderly age. It differs from research by Luthfi et al. which had respondents aged 16-18 years. [9] In this study, the gender of the sample was dominated by men, amounting to 52 people (96.3%); this is also different from research by Luthfi et al. where the most dominant gender of respondents was female with a total of 100 female students (65.4%). [9]

It is also because the number of security officers is more male. In this study, there were four groups of blood pressure: systolic blood pressure at night, morning systolic blood pressure, evening diastolic blood pressure, and morning diastolic blood pressure. The data obtained was measured at night and in the

morning for each respondent while the respondent was on night duty. In the evening systolic blood pressure, the normal blood pressure mode is 125 mmHg, while in the morning, the systolic blood pressure is 120 mmHg. In diastolic blood pressure at night, the normal blood pressure mode was found to be 80 mmHg, and diastolic blood pressure in the morning was lower than normal, namely 75.00 mmHg.

Regarding sleep quality, data was collected using the Pittsburg Sleep Quality Index (PSQI) questionnaire, where if the total score is >5, it means the respondent has poor sleep quality, and a score ≤5 means the respondent has good sleep quality. 23 The study results found that of the respondents, 39 people (72.2%) had poor sleep quality, and 15 (27.8%) had good sleep quality. When compared with Erri Pratama et al. (2018) on 42 respondents, 24 people (57.14%) had poor sleep quality, and 18 people (42.86%) had good sleep quality. [25] It means that this research is the same research by Erri Pratama et al. regarding the number of respondents who had poor sleep quality in this study being more dominant than respondents who had good sleep quality. [25]

The statistical tests carried out in this study did not show significant results because all significant P values were > 0.05. It was proven in research conducted by Erri Pratama et al. (2018), which showed that there was no relationship between sleep quality and increased blood pressure, with a significance value of P = 0.734 for systolic blood pressure and P = 0.353 for diastolic blood pressure. [25] The research results were not significant due to information bias, one of which was the dishonesty of respondents when filling out the questionnaire. Respondents who do not remember their bedtime also have difficulty filling out the questionnaire. Many respondents have irregular sleep schedules, where their sleep schedule is different due to external factors that influence this, so it is difficult for respondents to determine the exact number of hours of sleep per day. Another factor influencing respondents' uneven age distribution, with ages from late teens to early elderly, is one statistical test. [25] Clinically, young respondents tend to have normal blood pressure compared to older respondents, so young respondents, despite poor sleep quality, tend to have normal blood pressure. [25]

However, there is a difference in average systolic blood pressure between good and poor sleep quality of 3.03 mmHg, where systolic blood pressure with poor sleep quality tends to be higher. There is a difference in average diastolic blood pressure between good-quality and poor-quality sleep of 0.24 mmHg, where poor-quality sleep tends to be higher. It follows research by Luthfi et al. where students with poor sleep quality tend to have higher systolic blood pressure at 8.32 mmHg and diastolic blood pressure at 6.06 mmHg.[9]

CONCLUSION

Based on the results of research on the relationship between sleep quality and blood pressure in the security guard unit at the Indonesian Christian University in 2022, it can be concluded: a) The highest age number of officers at the Indonesian Christian University security unit is 26-35 years, a total of 22 people with a percentage of 40.7%; b) The largest gender of Indonesian Christian University security unit officers is 52 men with a presentation of 96.3%; c) Sleep quality of Indonesian Christian University security unit (SATPAM) officers, namely 39 people (72.2%) had poor sleep quality and 15 people (27.8%) had good sleep quality; d) Safety unit systolic blood pressure (SATPAM) at the Indonesian Christian University, namely at night the normal blood pressure mode is 125 mmHg, while in the morning the systolic blood pressure is at 120 mmHg. In the evening diastolic blood pressure, the blood pressure mode was found to be 80 mmHg and 82.5 mmHg, and in the morning, the blood pressure was also found to be lower than normal with the mode at 75 mmHg; e) There is no correlation between sleep quality and systolic and diastolic blood pressure at night or in the morning in the Indonesian Christian University security officer unit because all significance values (Asymp sig.) obtained in this statistical test are > 0.05. However, there is a difference in average systolic blood pressure between good and poor sleep quality of 3.03 mmHg, where systolic blood pressure with poor sleep quality tends to be higher. There is a difference in average diastolic blood pressure between good-quality and poor-quality sleep of 0.24 mmHg, where poor-quality sleep tends to be higher. Thus, it is recommended that future researchers develop this research further so that this research can become a source of more detailed information.

REFERENCES

[1] Shahoud JS, Sanvictores T, Aeddula NR. Physiology, arterial pressure regulation.

[2] Tamura K, Uchida K, Ishigami T. An interesting link between quality of sleep and a measure of blood pressure variability. The Journal of Clinical Hypertension. 2021 Feb;23(2):331. https://doi.org/10.1111/jch.14160 PMid:33373081 PMCid:PMC8029662

[3] Alfi WN, Yuliwar R. The relationship between sleep quality and blood pressure in patients with hypertension. Jurnal Berkala Epidemiologi. 2018;6(1):18. https://doi.org/10.20473/jbe.V6I12018.18-26

[4] Torquati L, Mielke GI, Brown WJ, Kolbe-Alexander T. Shift work and the risk of cardiovascular disease. A systematic review and meta-analysis including dose-response relationship. Scandinavian journal of work, environment & health. 2018 Jan 1;44(3):229-38. https://doi.org/10.5271/sjweh.3700 PMid:29247501

[5] Patterson PD, Mountz KA, Budd CT, Bubb JL, Hsin AU, Weaver MD, Turner RL, Platt TE, Guyette FX, Martin-Gill C, Buysse DJ. Impact of shift work on blood pressure among emergency medical services clinicians and related shift workers: A systematic review and meta-analysis. Sleep health. 2020 Jun 1;6(3):387-98. https://doi.org/10.1016/j.sleh.2020.03.006 PMid:32354630

[6] Cannizzaro E, Cirrincione L, Mazzucco W, Scorciapino A, Catalano C, Ramaci T, Ledda C, Plescia F. Night-time shift work and related stress responses: a study on security guards. International journal of environmental research and public health. 2020 Jan;17(2):562. https://doi.org/10.3390/ijerph17020562 PMid:31952337 PMCid:PMC7013811

[7] Ni'am AK, Irawan AD, Dewanto CA. Upaya Mewujudkan Pemuliaan Profesi Satuan Pengamanan Ditinjau Dari Peraturan Kepolisian Nomor 4 Tahun 2020. Media of Law and Sharia. 2021 Jun 30;2(3):254-71. https://doi.org/10.18196/mls.v2i3.11870

[8] Rukmi AM, Wardoyo A. Manajemen Sumber Daya Manusia. Lembaga Pengembangan Pendidikan, Kemahasiswaan.:123.

[9] Azmi S, Erkadius E. Hubungan kualitas tidur dengan tekanan darah pada pelajar kelas 2 SMA Negeri 10 Padang. Jurnal Kesehatan Andalas. 2017 Oct 12;6(2):318-23. https://doi.org/10.25077/jka.v6i2.698

[10] Sharma S, Hashmi MF, Bhattacharya PT. Hypotension. InStatPearls [internet] 2023 Feb 19. StatPearls Publishing.

[11] Guyton AC, Hall JE. Buku Ajar Fisiologi Kedokteran Edisi XII. Jakarta: Penerbit Buku Kedokteran EGC. 2016.

[12] Jacob M, Chappell D, Becker BF. Regulation of blood flow and volume exchange across the microcirculation. Critical care. 2016 Dec;20:1-3. https://doi.org/10.1186/s13054-016-1485-0 PMid:27765054 PMCid:PMC5073467

[13] Pendit BU, Ganong WF. Buku Ajar Fisiologi Kedokteran. EGC.

[14] Wong ML, Lau EY, Wan JH, Cheung SF, Hui CH, Mok DS. The interplay between sleep and mood in predicting academic functioning, physical health and psychological health: A

longitudinal study. Journal of psychosomatic research. 2013 Apr 1;74(4):271-7. https://doi.org/10.1016/j.jpsychores.2012.08.014 PMid:23497826

[15] Parati G, Stergiou GS, Dolan E, Bilo G. Blood pressure variability: clinical relevance and application. The Journal of Clinical Hypertension. 2018 Jul;20(7):1133-7. https://doi.org/10.1111/jch.13304 PMid:30003704 PMCid:PMC8030809

[16] Lo K, Woo B, Wong M, Tam W. Subjective sleep quality, blood pressure, and hypertension: a meta-analysis. The Journal of Clinical Hypertension. 2018 Mar;20(3):592-605. https://doi.org/10.1111/jch.13220 PMid:29457339 PMCid:PMC8031314

[17] YILMAZ D, TANRIKULU F, DIKMEN Y. Research on sleep quality and the factors affecting the sleep quality of the nursing students. Current health sciences journal. 2017 Jan;43(1):20.

[18] Ohayon M, Wickwire EM, Hirshkowitz M, Albert SM, Avidan A, Daly FJ, Dauvilliers Y, Ferri R, Fung C, Gozal D, Hazen N. National Sleep Foundation's sleep quality recommendations: first report. Sleep health. 2017 Feb 1;3(1):6-19. https://doi.org/10.1016/j.sleh.2016.11.006 PMid:28346153

[19] Lyu B, Hagen EW, Finn LA, Peppard PE. Blood pressure dipping and sleep quality in Wisconsin Sleep Cohort. Journal of hypertension. 2020 Mar;38(3):448. https://doi.org/10.1097/HJH.0000000000002283 PMid:31714339 PMCid:PMC7882242

[20] Cifu AS, Davis AM. Prevention, detection, evaluation, and management of high blood pressure in adults. Jama. 2017 Dec 5;318(21):2132-4. https://doi.org/10.1001/jama.2017.18706 PMid:29159416

[21] Artina N, Cholid I. Pengaruh Tingkat Literasi Keuangan dan Faktor Demografi terhadap Pengambilan Keputusan Investasi (Studi Kasus Pegawai Kantor Badan Kepegawaian Daerah Sumatera Selatan). Jurnal Keuangan dan Bisnis. 2018 Apr 29;16(1):84-99. https://doi.org/10.32524/jkb.v16i1.575

[22] Abduh N, Idris S, Mulyani SP. Public Awareness in Management of Pro-Environmental and Sustainable Tourism Area.

[23] Rahayu CW, Rahmawati CH. The Determinant Factors Of Personal Financial Management Of Indonesian Migrant Workers In Hongkong. Mix: Jurnal Ilmiah Manajemen. 2021 Feb;11(01):349336. https://doi.org/10.22441/mix.2021.v11i1.004

[24] Artaria MD. Dasar biologis variasi jenis kelamin, gender, dan orientasi seksual. Jurnal BioKultur. 2016;5(2):157-65.

[25] Pratama E, Pangalila F. Hubungan kualitas tidur dengan tekanan darah pada karyawan Universitas Tarumanagara. Tarumanagara Medical Journal. 2019 May 2;1(2):313-8.

(Frits Reinier Wantian Suling) Relationship between Sleep Quality and Blood Pressure of the Indonesian Christian University Security Officer Unit in 2022

ORIGINALITY REPORT

15%	10%	9%	9%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	Submitted to Trisakti University Student Paper	2%
2	Beini Lyu, Erika W. Hagen, Laurel A. Ravelo, Paul E. Peppard. "Blood pressure dipping and sleep quality in the Wisconsin Sleep Cohort", Journal of Hypertension, 2020 Publication	2%
3	eprints.ners.unair.ac.id Internet Source	2%
4	libir.josai.ac.jp Internet Source	1%
5	Gianfranco Parati, George S. Stergiou, Eamon Dolan, Grzegorz Bilo. "Blood pressure variability: clinical relevance and application", The Journal of Clinical Hypertension, 2018 Publication	1%
6	Submitted to University Of Tasmania Student Paper	1%

7	www.ejournal.pelitaindonesia.ac.id Internet Source	1 %
8	Submitted to University of Durham Student Paper	1 %
9	www.ncbi.nlm.nih.gov Internet Source	1 %
10	Submitted to Grwp Llandrillo Menai Student Paper	1 %
11	erepo.unud.ac.id Internet Source	1 %
12	P. Daniel Patterson, Kristina A. Mountz, Caitlin T. Budd, Jenna L. Bubb et al. "Impact of shift work on blood pressure among emergency medical services clinicians and related shift workers: A systematic review and meta-analysis", Sleep Health, 2020 Publication	1 %
13	Submitted to Universitas Muhammadiyah Yogyakarta Student Paper	1 %
14	www.ijbmm.com Internet Source	1 %
15	Ferrari, Alberto, Stefano Perlini, and Marco Centola. "The Autonomic Nervous System in Hypertension", Hypertension Principles and Practice, 2005.	1 %

Publication

Exclude quotes	On	Exclude matches	< 1%
Exclude bibliography	On		