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RESEARCH ARTICLE

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Physical Activity, Sleep Patterns, Stress Status and the Incidence of Hypertension in Adolescents

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ABSTRACT

Hypertension is a non-communicable disease. Hypertension is not only suffered by adults and the elderly; adolescents can also suffer from hypertension. Hypertension in adolescents can increase the risk of health problems in the future. This study aimed to determine the relationship between lifestyle and the incidence of hypertension in adolescents using a cross-sectional study design. The population in this study were all residents living in the Paccerrakang Public Health Centres and The Sudiang Public Health Centres working areas. The sampling technique was a simple random sampling technique to get a research sample of 81 adolescents. How to collect data through interviews, and then the results were analyzed using SPSS version 20. The Chi-Square test results show sleep pattern p-value = 0.037 (<0.05), stress status p-value = 0.264 (<0.05), physical activity p-value = 0.18 (<0.05). The conclusion is sleep patterns and physical activity and the incidence of hypertension in adolescents. In contrast, stress status does not have a significant relationship with the incidence of hypertension in adolescents.

Keywords: hypertension; adolescents; lifestyle

INTRODUCTION

Background

Along with the times, consciously and unconsciously, humans tend to follow a modern lifestyle. Things like this make people like instant things. As a result, they tend to be lazy to do physical activity and like to eat fast food that contains high fat and sodium. Modern lifestyles often make people depressed, leading to stress, smoking, and excessive alcohol and caffeine consumption. Such habits can trigger a person to develop hypertension.

Hypertension is an increase in systolic blood pressure above the standard limit of more than 140 mmHg and diastolic blood pressure of more than 90 mmHg. Hypertension is a condition where a person experiences an increase in blood pressure above normal which increases morbidity/morbidity and mortality/mortality.⁽¹⁾

According to the World Health Organisation (WHO), in 2011, 1 billion people worldwide suffer from hypertension, two-thirds of whom are in low- and moderate-income developing countries. The prevalence of hypertension will continue to rise sharply, and it is predicted that by 2025, around 29% of adults worldwide will suffer from hypertension. Hypertension has resulted in the deaths of about 8 million people each year 1.5 million deaths occur in Southeast Asia, where one-third of the population suffers from hypertension.⁽²⁾

Quoted by hallo sehat, hypertension is Indonesia's fifth leading cause of death. 1 in 4 people must have hypertension.⁽³⁾ Riskesdas 2018 states that the prevalence of hypertension based on measurement results in the population aged ≥ 18 years is 34.1%, the highest in South Kalimantan (44.1%), while the lowest in Papua is (22.2%). The estimated number of hypertension cases in Indonesia is 63,309,620 people, while the death rate in Indonesia due to hypertension is 427,218.⁽⁴⁾

Based on data from the Makassar city health office, in 2022, the services for hypertension sufferers were 300,530. The Paccerrakang Public Health Centres is one of the most significant contributors to hypertension in 2021, with an estimated number of hypertensive patients ≥ 15 years of age of 13,280 people, so 11,204 people get

health services and an increase in 2022 get health services of 12,467 people. The number of people with hypertension aged 18-24 is 307 sufferers. Whereas in the Sudiang health center, the estimated number of people with hypertension aged ≥ 15 years was 3411 sufferers, who received health services as many as 2451 sufferers and experienced an increase in cases in 2022, namely 14,394 cases. The number of people with hypertension in adolescents aged 15-21 is 121 sufferers.

Hypertension is a non-communicable disease; hypertension is also a silent killer because it is difficult to detect someone. After all, hypertension has no specific signs/symptoms. Symptoms that are easy to observe as they occur in mild symptoms are dizziness or headache, anxiety, redness of the face, sore nape, irritability, ringing in the ears, difficulty sleeping, shortness of breath, heaviness in the nape of the neck, easy fatigue, foggy eyes, nosebleeds.⁽⁵⁾

Hypertension is not only suffered by adults and the elderly; adolescents can also suffer from hypertension. Hypertension in adolescents can increase the risk of health problems in the future. If this condition is left untreated, hypertension can cause more severe complications early on, such as heart attack, heart failure, and stroke.

From the above problems, the researcher aims to examine the relationship between physical activity, sleep patterns, and stress status with the incidence of hypertension in adolescents in the Paccerakkang Public Health Centres and the Sudiang Public Health Centres Working Areas in 2023.

METHODS

This type of research was analytical research with a cross-sectional study approach, a study in which measurement or data collection is carried out at one time. This research design determined the relationship between lifestyle and hypertension in adolescents at the Paccerakkang Public Health Centres and the Sudiang Public Health Centres. The research was on May 9-31, 2023, in the working areas of the Paccerakkang Health Center and Sudiang Health Center. The population of this study was all residents living in the Paccerakkang Health Center and Sudiang Health Center. The study sample used the Slovin formula got an example that it was of 81 adolescents. The sampling technique used is a simple random sampling technique, which is random sampling.⁽⁶⁾

The variables included physical activity, stress status, and sleep patterns. The data source in this study was primary data obtained directly from respondents through interviews and filling out questionnaires that have been prepared, in contrast, secondary data available are from documents at Paccerakkang Health Center and Sudiang Health Center. Data analysis using SPSS version 20 was and then presented by distributing through descriptive and bivariate analysis. This study included informed consent on the questionnaire to obtain agreement and participation from respondents. Then, the data presented was the privacy and confidentiality of the researcher.

RESULTS

Table 1 shows that the age group 15-17 years was more, namely 50.6%. According to gender, the male group was more, namely 63.0%.

Table 1. Distribution of malaria breeding places

No.	Variables	Frequency	Percentage
Age			
1.	• 18-21 years	40	49.4
	• 15-17 years	41	50.6
Gender			
2.	• Male	51	63.0
	• Female	30	37.0

Table 2 shows that hypertension was more prevalent in adolescents with poor sleep patterns (72.5%) than in adolescents with good sleep patterns (46.7%). Chi-Square test results showed a significant relationship between sleep patterns and hypertension (p-value <0.05). The Prevalence Ratio (PR) calculation results show that poor sleep patterns had a risk of 1.555 times compared to adolescents who had good sleep patterns (95%CI 1.023-2.362).

Table 3 shows that hypertension was more prevalent in adolescents who experience stress (77.2%) than adolescents who did not experience stress (50.0%). Chi-Square test results showed no significant relationship between stress status and hypertension (p-value >0.05).

Table 4 shows that hypertension was more prevalent in adolescents who do not regularly do physical activity (70.3%) compared to adolescents who regularly did physical activity (35.3%). Chi-Square test results showed a significant relationship between physical activity and hypertension (p-value <0.05). The Prevalence

Ratio (PRPR) calculation results show that adolescents who did not regularly did physical activity have a risk of 1.992 times compared to adolescents who regularly do physical activity (95%CI 1.027-3.866).

Table 2. The relationship between sleep patterns and the incidence of hypertension in adolescents

Sleep patterns	Hypertension status				Total		PR 95%CI	p-value
	Hypertension		Not hypertensive		f	%		
	f	%	f	%				
Bad	37	72.5	14	27.5	51	100	1.555 (1.023-2.362)	0.037
Good	14	46.7	16	53.3	30	100		

Table 3. Relationship between stress status and incidence of hypertension

Stress status	Hypertension status				Total		PR 95%CI	p-value
	Hypertension		Not hypertensive		f	%		
	f	%	f	%				
Stress	41	67.2	20	32.8	61	100	1.344 (0.838-2.155)	0.264
No stress	10	50.0	10	50.0	20	100		

Table 4. Relationship between physical activity and incidence of hypertension

Physical activity	Hypertension status				Total		PR 95%CI	p-value
	Hypertension		Not hypertensive		f	%		
	f	%	f	%				
No	45	70.3	19	29.7	51	100	1.992 (1.027-3.866)	0.018
Yes	6	35.3	11	64.7	30	100		

DISCUSSION

Sleep Patterns

Research conducted in the working area of Paccerrakkang Health Centre and Sudiang Health Centre shows that sleep patterns have a significant relationship with the incidence of hypertension in adolescents. Hypertension is suffered by most adolescents who have poor sleep patterns, while adolescents who have good sleep patterns do not suffer from hypertension.

This study aligns with research conducted by Lumantow I et al. (2016), showing the results of the Chi-Square test conducted with a confidence level of 95% obtained a value of $P = 0.000$. It means a significant relationship exists between sleep quality and blood pressure in adolescents in Upper Tombasian Village. (7) This study is also commensurate with research conducted by Roshifani S (2016) said the results of the *Chi-Square* statistical test obtained a value of $p < \alpha = 0.05$, meaning that there is a statistically significant relationship between sleep patterns and the incidence of hypertension at the Tanah Kalikedinding Surabaya Health Centre. (8)

Sleep that is not following age-appropriate sleep needs and poor sleep quality can interfere with health and disrupt a person's physiological and psychological balance. Physiological impacts include decreased daily activities, fatigue, weakness, decreased endurance, and instability of vital signs. Psychological impacts include depression, anxiety, and lack of concentration. (9)

Stress Status

Based on the research that has been done, there is no significant relationship PR between stress status and the incidence of hypertension in adolescents in the Paccerrakkang Public Health Centres and the Sudiang Public Health Centres working areas.

This study is not in line with research conducted by Subrata & Wulandari (2020), which states that there is a relationship between stress and systole and diastole blood pressure of productive age hypertensive patients with a p-value of 0.032 and 0.000. Hypertensive patients with high-stress risk experienced increased systole blood pressure 3.29 times and diastole ten times compared to patients with low stress. (10)

Stress that is constant and continues for a long time can increase sympathetic nerves, which can trigger increased blood pressure. In addition, if the state is often emotional and negative, thinking slowly and unconsciously will appear as physical symptoms such as hypertension. A person's psychological condition is different if a person's psychological condition can affect blood pressure. Stress can also result in increased blood

flow to the kidneys, skin, and digestive tract, and the body will increasingly produce the hormone adrenaline, which can make the heart system work will be stronger and faster. ⁽¹¹⁾

Physical Activity

Based on this study, there is a significant relationship between physical activity and the incidence of hypertension in adolescents. Adolescents who rarely do physical activity suffer more from hypertension. The *Prevalence Ratio* (PR) calculation results show that adolescents who do not regularly do physical activity 1.992 times suffer from hypertension compared to adolescents who regularly do physical activity.

This study aligns with findings, which states that there is an association between physical activity and the incidence of hypertension in adolescents. ⁽¹²⁻²⁷⁾

This study illustrates that physical activity carried out by adolescents in the Paccerrakkang and The Sudiang public health centers working areas needs to be improved. Many adolescents still do not regularly or rarely do physical activities such as exercise for ≥ 30 minutes. It is caused by non-physical activities such as studying, playing on mobile phones, watching TV, and hanging out with peers. Adolescents who do not regularly or rarely do physical activity and prefer non-physical activities can draw the process of burning fat in the body so that the storage of fat in the body increases, which will cause the narrowing of blood vessels. It will trigger hypertension.

CONCLUSION

Based on the research that has been done, it can be concluded that: there is a significant relationship between sleep patterns and physical activity with the incidence of hypertension in adolescents. It can be suggested to health workers to increase counseling activities, especially for adolescents about hypertension, and also to routinely check their health, especially blood pressure, regulate sleep patterns properly, routinely do physical activity, and be good at managing stress.

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