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Incidence of Hypertension in Adolescents in the Working Areas of Paccerakkang Health Center and Sudiang Health Center in Makassar City

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ABSTRACT

Hypertension generally occurs in the elderly, but several studies have shown that hypertension can appear as early as adolescence and its prevalence has increased over the past few decades. However, many have not realized that this is the cause of the appearance of hypertension in adulthood and the elderly. This study aims to determine the prevalence of hypertension in adolescents at the Sudiang Raya Health Center, Makassar City. The method used was observation with a Cross Sectional approach. The study sample was 147 adolescents using Two Stage Cluster Sampling. Data collection using questionnaires, measurement of weight, height and blood pressure. Data were analyzed univariately using frequency distribution tables. The results showed that there were 73 male respondents (49.7%) and 74 female respondents (50.3%). Most (77.6%) respondents had a moderate level of knowledge. The results of blood pressure measurements showed that 9 people (6.1%) were categorized as stage 2 hypertension, 18 people (12.2%) were categorized as stage 1 hypertension, 22 people (15.0%) were categorized as pre-hypertension and 98 people (66.7%) had normal blood pressure. Closing: The results showed that one third of respondents already had hypertension.
Keywords: hypertension, adolescents, incidence.

Keywords: *Fever, Ibuprofen, Paracetamol*

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INTRODUCTION

Hypertension is one of the most dangerous health problems in the world, because hypertension is a major risk factor leading to cardiovascular diseases such as heart attack, heart failure, stroke and kidney disease which in 2016 ischemic heart disease and stroke became the two leading causes of death in the world (WHO, 2018). The incidence of hypertension worldwide reaches more than 1.3 billion people, which represents 31% of the

world's adult population which has increased by 5.1% greater than the global prevalence in 2000-2010 (Bloch, 2016). The prevalence of hypertension in Indonesia obtained from blood pressure measurements in the population aged ≥18 years has increased from 25.8% in 2013 to 34.11%. Central Java ranks fourth in the occurrence of hypertension in Indonesia at 37.57% (Ministry of Health, 2018). According to the Central Java Health Profile, hypertension accounts for the largest proportion of reported non-communicable diseases, at 57.87% (Central Java Provincial Health Office, 2015). Based on the Semarang Regency Health Profile, the incidence of hypertension increased from 2013 to 2015, from 35,294 cases to 40,869 cases and 41,134 cases.

Hypertension generally occurs in the elderly, but several studies have shown that hypertension can be present as early as adolescence and its prevalence has increased over the past few decades, yet many are unaware of the causes of hypertension in adulthood and the elderly. Hypertension is an important condition in children, with an estimated population prevalence of 1-2% in developed countries. Nutrition surveys in the US show a significant increase in systolic blood pressure and diastolic blood pressure. The causes of increased blood pressure are attributed to obesity, dietary changes, decreased physical activity and increased stress (Sangamesh, 2016). The prevalence of hypertension in adolescents was 9% in 2007, then increased to 10.7% in 2013 (Ministry of Health, 2013). Adolescents and young adults who are in the age range of 15-25 years have a hypertension prevalence rate of 1 in 10 people.

In a study conducted by Kini (2016), the prevalence of prehypertension and hypertension in young adults (aged 20-30 years) was 45.2%. Research conducted by Fitrianingsih (2015) found that the incidence of hypertension in adolescents at SMAN 1 Ungaran was 57.6%. The mechanism of hypertension in adolescents is influenced by several factors related to lifestyle. These factors include overweight or obesity, family history of hypertension or genetic factors, race or ethnicity, gender, weight, and age, smoking, physical activity or exercise and low knowledge. Risk factors for unhealthy lifestyles in adolescents are caused by many factors, one of which is knowledge. Knowledge or cognitive is a domain that greatly influences a person's actions or behavior (Notoatmodjo, 2012).

The low knowledge of health workers, patients, and the public about hypertension is the main cause of uncontrolled blood pressure, especially in hypertensive patients in Asia (Park, J.B., 2015).Things that can be done as an effort to improve health are not just repairing damage or physical abnormalities, but involve the complexity of individual needs, motivations, and priorities that can be done through intrapersonal communication involving the soul, will, awareness, and thoughts (Arianto, 2013). This study aims to determine the prevalence of hypertension in adolescents at the Sudiang Raya Health Center in Makassar City.

RESEARCH METHODOLOGY

The study was conducted observational with a cross sectional approach which aims to determine the prevalence of hypertension in adolescents at the Sudiang Raya

Health Center, Makassar City, by means of an observation approach or data collection at one time (point time approach). This research was conducted in the Sudiang Raya Health Center area of Makassar City which consists of 56 RT and 11 RW of Sudiang Raya Village, Biringkanaya District, Makassar City with a total population of 19,765 people (2019 survey). The sample of this study is part of the population determined by the survey sample formula in the final population of 147 students. Sampling was done with two stage cluster sampling. In the first stage, group selection was carried out as a sample, namely selecting sub-districts as groups / clusters. The selection of groups in the Sudiang Raya sub-district of Makassar City. The variables measured in this study include: prevalence of hypertension, gender, and level of knowledge about hypertension in adolescents. Data were collected using questionnaires and physical measurements of weight, height, and blood pressure. Data were analyzed univariately using frequency distribution tables.

RESULT AND DISCUSSION

Adolescence, which is the transition from child to adult, causes adolescents to differ from children and adults both in lifestyle and habits and metabolic changes in the body. This causes disease patterns in adolescents to be different from younger children. With changes in lifestyle, adolescents are vulnerable to the onset of various diseases and one of them is hypertension. The prevalence in developed countries is 35% and in developing countries it is 40% of the adult population. By 2025, it is estimated that hypertension cases, especially in developing countries, will increase by 80% from 639 million cases in 2000 to 1.15 billion cases. This prediction is based on the number of people with hypertension and the increase in the current population (Sukarmin, 2013).

The results of the study found that the distribution of respondents based on gender was almost equal between men (49.7%) and women (50.3%). The level of knowledge of respondents was divided into three categories, namely less as many as 28 people (19.0%), enough as many as 114 people (77.6%), and good as many as 5 people (3.4%). The results of this study indicate that respondents' knowledge about hypertension is still not good. The results of research conducted by Grad (2015) in Poland found that almost half of adolescents (49.2%) had a low level of knowledge about hypertension, almost 38% had moderate knowledge, and only 13% had this knowledge at a good level.

Table 1: Characteristics of Adolescents

Characteristics	**f**	**%**
Gender		
Male	73	49,7
Female	74	50,3
Knowledge		
Less	28	19,0
Enough	114	77,6
Good	5	3,4
Hypertension Category		

Grade 1 Hypertension	9	6,1
Grade 2 Hypertension	18	12,2
Pre-hypertension	22	15,0
Normal	98	66,7

Source: Primary Data, 2024

Table 1 shows the incidence of hypertension in respondents with the distribution of stage 2 hypertension as many as 9 people (6.1%), stage 1 hypertension as many as 18 people (12.2%) and pre-hypertension as many as 22 people (15.0%). The results found in this study are greater when compared to some research results, including those conducted on students and students in Surabaya, namely 6.4% (Santoso, 2013), those conducted on high school students in Semarang City, namely 12.0% (Kurnianingtyas, 2017), and Pangkalpinang, which is 22.5% (Yusrizal, 2016). The hypertension problem found in this study is lower than the research conducted at SMA Negeri 1 Ungaran in 2015, which found out of 92 respondents there were 57.6% who experienced hypertension (Fitrianingsih, 2016). Research conducted in Jakarta also found 42.4% of adolescents at SMA Sejahtera 1 Depok had hypertension (percentile ≥ 95) (Angesti, 2018). The difference in the incidence of hypertension is likely due to differences in the use of blood pressure measuring devices, the type of hand, and the criteria used.

Table 2: Prevalence of Hypertension Based on Adolescent Characteristics

Characteristics	**Hypertension**		**No Hypertension**	
	f	**%**	**f**	**%**
Gender				
Male	22	30,1	51	69,9
Female	27	36,5	47	63,5
Knowledge				
Less	8	28,6	20	71,4
Enough	40	35,1	74	64,9
Good	1	20,0	4	80,0

Source: Primary Data, 2024

The incidence of hypertension usually occurs in the elderly, but several studies have shown that hypertension can appear since adolescence and its prevalence has increased in recent years (Kurnianingtyas, 2017). This condition needs to be watched out for considering that hypertension in adolescence will have a disruptive effect on various organs and is a risk factor for various degenerative diseases in old age, including cardiovascular disease. Butch (2011) also states that adolescents with high blood pressure can increase the risk of hypertension in adulthood and suffer from complications of diseases caused by hypertension.

Many factors cause hypertension in adolescents, which can be divided into modifiable and irreversible risk factors. Efforts to prevent and manage hypertension are based on risk factors that can be changed, including changes in diet and lifestyle. Preventive efforts that can be made include: changes in diet, limiting the use of salt to 4-6 gr per day, foods containing baking soda, seasonings and food preservatives, reducing

foods that contain high cholesterol (offal, egg yolks, squid, mussels, crabs, chocolate, butter, and margarine), stopping smoking, drinking alcohol, regular exercise and avoiding stress. Another opinion states that risk factors that can be changed include obesity, excess sodium intake, smoking, physical activity, and sleep quality. Meanwhile, risk factors that cannot be changed include family history of hypertension, low birth weight, and gender (Dharnidharka, 2015 & Nuraini, 2015).

The incidence of hypertension in adolescents begins with overweight or obesity related to lifestyle. The results of this study indicate that the incidence of hypertension is more experienced by female respondents (36.5%) compared to male respondents (30.1%). This can be due to lifestyle, especially the diet of adolescent girls who prefer to consume fatty foods or high sodium.Dietary salt intake patterns: the world health agency, the World Health Organization (WHO) recommends salt consumption patterns that can reduce the risk of hypertension. The recommended sodium level is no more than 100 mmol (about 2.4 grams of sodium or 6 grams of salt) per day. Excess sodium consumption causes the concentration of sodium in the extracellular fluid to increase. To normalize it, the intracellular fluid is drawn outward, thus increasing the volume of extracellular fluid. The increase in extracellular fluid volume causes an increase in blood volume, resulting in the onset of hypertension (Shapo, 2003).

The results of this study are different from several studies conducted previously, such as Arum (2019) who found that the incidence of hypertension was more experienced by male adolescents (43.7%) than females (31.0%). Meanwhile, research by Yusrizal, et al (2016) also showed that there was a significant difference in the incidence of hypertension in adolescent boys and girls. This is likely due to differences in hormonal mechanisms that affect blood pressure. In addition, the significant difference in the proportion of hypertension in males and females may be due to smoking habits which are significantly higher in males. The relationship between smoking and increased risk of cardiovascular disease has been widely proven. In addition to the duration, the risk due to smoking is greatest depending on the number of cigarettes smoked per day. A person who smokes more than one pack of cigarettes a day has twice the risk of a non-smoker. Toxic chemicals, such as nicotine and carbon monoxide that are inhaled through cigarettes, enter the bloodstream and damage the endothelial lining of arterial blood vessels, resulting in the process of atherosclerosis and hypertension. In just a few seconds nicotine reaches the brain.

The brain reacts to nicotine by signaling the adrenal glands to release epinephrine (adrenaline). The hormone constricts blood vessels and forces the heart to work harder due to higher pressure. After smoking just two cigarettes, both systolic and diastolic pressure will increase by 10 mmHg. Blood pressure will remain at this height for up to 30 minutes after stopping smoking. After the effects of nicotine slowly wear off, blood pressure will also decrease slowly. In heavy smokers the blood pressure will be at a high level throughout the day. Second-hand smoke is also associated with damage to the vascular endothelium and consequent increase in blood pressure. Research conducted

by Seyedzadeh et al, (2012) showed that exposure to cigarette smoke can increase blood pressure in children and have a risk of cardiovascular disease in the future.

Hypertensive disease progresses slowly and may not be felt until it causes significant organ damage. The higher the blood pressure the greater the risk of organ damage (Price, 2012). Uncontrolled hypertension will cause various complications, when it comes to the heart there is a possibility of myocardial infarction, coronary heart disease, congestive heart failure, when it comes to the brain there is a stroke, hypertensive encevalopathy, and when it comes to the kidneys there is chronic kidney failure, while when it comes to the eyes there will be hypertensive retinopathy. The various complications that may arise are very serious diseases and have an impact on the patient's psychology because of their low quality of life, especially in cases of stroke, kidney failure, and heart failure. High blood pressure generally increases the risk of these complications. Untreated hypertension will affect all organ systems and eventually shorten life expectancy by 10-20 years (Cardiology, 2014).

Mortality in hypertensive patients is more rapid if the disease is not controlled and has caused complications to several vital organs. The most common cause of death is heart disease with or without stroke and kidney failure (Hoeymans, 1999). Therefore, the treatment of hypertension is indeed an important thing, but it is incomplete without preventive measures to reduce the risk factors for cardiovascular disease due to hypertension.

CONCLUSION

The results showed that out of 147 respondents, one third had hypertension with a distribution of stage 2 hypertension as many as 9 people (6.1%), stage 1 hypertension as many as 18 people (12.2%), and pre-hypertension as many as 22 people (15.0%), and as many as 98 people (66.7%) who had normal blood pressure. Hypertension in adolescents needs to be watched out for so it is important to routinely measure blood pressure in adolescents. Various risk factors for hypertension need to be considered in adolescents.

Suggestions need to be made early prevention efforts related to diet and lifestyle in adolescents, including: changes in diet, limiting the use of salt to 4-6 gr per day, foods containing baking soda, seasonings and food preservatives, reducing foods that contain high cholesterol (offal, egg yolks, squid, mussels, crabs, chocolate, butter, and margarine), stopping smoking, drinking alcohol, regular exercise and do not stress.

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