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INCIDENCE OF HYPERTENSION IN ADOLESCENTS IN THE WORKING AREA OF PACCERAKKANG HEALTH CENTER AND SUDIANG HEALTH CENTER, MAKASSAR CITY

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Abstract

Hypertension generally occurs in advanced age, but some studies suggest that hypertension can appear as early as adolescence and its prevalence has increased over the past few decades. However, many do not realize that it is the cause of hypertension in adults 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 is carried out by observation with a *Cross Sectional* approach. The research sample was 147 adolescents using *Two Stage Cluster Sampling*. Data collection using questionnaires, measurements of weight, height and blood pressure. The data were analyzed univariately using a frequency distribution table. The results of the study obtained 73 male respondents (49.7%) and 74 female respondents (50.3%). Most (77.6%) of the respondents had a moderate level of knowledge. The results of blood pressure measurements showed that as many as 9 people (6.1%) were in the stage 2 hypertension category, as many as 18 people (12.2%) were in the stage 1 hypertension category, as many as 22 people (15.0%) were in the pre-hypertension category and as many as 98 people (66.7%) had normal blood pressure. Conclusion: The results showed that one-third of the respondents already had hypertension.

Keywords: hypertension, rage, incidence

INTRODUCTION

Hypertension is one of the most dangerous health problems in the world, because hypertension is the main risk factor that leads to cardiovascular diseases such as heart attack, heart failure, stroke and kidney disease, where in 2016 ischemic heart disease and stroke became the two main 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% more 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 incidence of hypertension in Indonesia, which is 37.57% (Ministry of Health of the Republic of Indonesia, 2018). According to Central Java Health Profile data, hypertension disease occupies the largest proportion of reported non-communicable diseases, which is 57.87% (Central Java Provincial Health Office, 2015). Based on the Semarang Regency Health Profile, there was an increase in the incidence of hypertension from 2013 to 2015, namely 35,294 cases to 40,869 cases and 41,134 cases.

Hypertension generally occurs in advanced age, but some studies show that hypertension can appear as early as adolescence and its prevalence has increased over the past few decades, but many are not aware of it so it is the cause of hypertension in adults 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 U.S. show significant improvements in systolic blood pressure and diastolic blood pressure. The causes of increased blood pressure are associated with 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 of the

Republic of Indonesia, 2013). Adolescents and young adults in the age range of 15-25 years have a prevalence rate of hypertension 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, low birth weight, high salt consumption, smoking, physical activity or exercise and low knowledge. Risk factors for an unhealthy lifestyle in adolescents are caused by many factors, one of which is knowledge. Knowledge or cognition 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 physical damage or abnormalities, but involve the complexity of individual needs, motivations, and priorities that can be done through intrapersonal communication involving the soul, will, consciousness, and mind (Arianto, 2013). This study aims to find out the prevalence of hypertension in adolescents at the Sudiang Raya Health Center, Makassar City.

METHOD

The research was carried out observantly 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 a time (*point time approach*). This research was conducted in the Sudiang Raya Health Center area, Makassar City, which consists of 56 RTs and 11 RWs, Sudiang Raya Village, Biringkanaya District, Makassar City with a population of 19,765 people (2019 survey). The sample of this study is part of the population determined by the survey sample formula on the finish population of 147 students. Sampling was carried out by *two-stage cluster sampling*. In the first stage, a group was selected as a sample, namely choosing a sub-district as a group/*cluster*. The group selection was obtained in Sudiang Raya District, Makassar City. The variables measured in this study include: prevalence of hypertension, gender, and level of knowledge about hypertension in adolescents. Data was collected using questionnaires and physical measurements, namely weight, height, and blood pressure. Data analysis was carried out univariate using a frequency distribution table.

RESULTS AND DISCUSSION

Adolescence, which is the transition of children to adults, causes adolescents to be different from children and adults both in lifestyle and habits as well as metabolic changes in the body. This causes the disease pattern in adolescents to be different from younger children. With lifestyle changes, adolescents are susceptible to the onset of various diseases and one of them is hypertension. The prevalence in developed countries is 35% and in developing countries 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, which is 1.15 billion cases. This prediction is based on the number of hypertension sufferers and the current population growth (Sukarmin, 2013).

The results of the study obtained that the distribution of respondents based on gender was almost the same between men (49.7%) and women (50.3%). The level of knowledge of respondents was divided into three categories, namely 28 people (19.0%)

who were poor, 114 people (77.6%) who were moderate, and 5 people who were good (3.4%). The results of this study show that respondents' knowledge about hypertension is still not good. The results of a study 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 such knowledge at a good level. Characteristics of adolescents based on gender, knowledge and category of hypertension can be seen in table 1.

Table 1: Characteristics of Adolescents

Characteristic	f	%
Gender		
Man	73	49,7
Woman	74	50,3
Knowledge		
Less	28	19,0
Enough	114	77,6
Good	5	3,4
Categories Hypertension		
Grade 1 hypertension	9	6,1
Grade 2 hypertension	18	12,2
Pre-hypertension	22	15,0
Usual	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 of the research found in this study are larger when compared to several research results, including those conducted on students and students in Surabaya, which is 6.4% (Santoso, 2013), which is carried out on high school students in Semarang City, which is 12.0% (Kurnianingtyas, 2017), and Pangkalpinang, which is 22.5% (Yusrizal, 2016). The hypertension problem found in this study was lower than the study conducted at SMA Negeri 1 Ungaran in 2015, which found that out of 92 resonances there were 57.6% who experienced hypertension (Fitrianingsih, 2016). Research conducted in Jakarta also found that 42.4% of adolescents at SMA Sejahtera 1 Depok experienced 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.

The prevalence of hypertension based on adolescent characteristics can be seen in table 2. Adolescents with hypertension have good knowledge only (20%) while those have sufficient knowledge (35.1%) and lack of knowledge (28.6%). A person's understanding is obtained through knowledge which is the result of knowing and this happens after the person senses a certain object. Sensing occurs through the five human senses, namely the senses of sight, hearing, smell, taste and touch. Most of human knowledge is acquired through the eyes and ears. Knowledge will underlie beliefs about an object and will form a habit, this will then give rise to the will that arises in attitudes and behaviors (Notoatmodjo, 2012). Grad (2015) said that adolescents whose blood pressure had been checked showed good knowledge about hypertension, with the most sources of information being from school.

Table 2: Prevalence of Hypertension Based on Adolescent Characteristics

Characteristic	Hypertension		No Hypertension	
	f	%	f	%

Gender				
Man	22	30,1	51	69,9
Woman	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 age group, but some studies show that hypertension can appear as early as 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 cause disorders in various organs and is a risk factor for various degenerative diseases of the elderly, including cardiovascular diseases. Butch (2011) also stated that adolescents with high blood pressure can increase the risk of hypertension in adulthood and suffer from complications of the disease caused by hypertension.

There are many factors that cause hypertension in adolescents, which can be differentiated into modifiable and non-modifiable risk factors. Efforts to prevent and control hypertension are based on risk factors that can be changed, including changes in diet and lifestyle. Prevention efforts that can be taken include: dietary changes, limiting the use of salt to 4-6 grams per day, foods that contain baking soda, flavorings and food preservatives, reducing foods that contain high cholesterol (offal, egg yolk, squid, shellfish, crab, chocolate, butter, and margarine), stopping smoking, drinking alcohol, exercising regularly and avoiding stress. Other opinions state that risk factors that can be changed include obesity, excess sodium intake, smoking habits, 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 is often started with obesity or obesity related to lifestyle. The results of this study showed that the incidence of hypertension was 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 or high-sodium foods. Salt intake patterns in the diet: the world health organization, 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. Excessive sodium consumption causes the concentration of sodium in extracellular fluids to increase. To normalize it, the intracellular fluid is drawn outwards, so the volume of extracellular fluid increases. The increase in the volume of extracellular fluid causes an increase in blood volume, resulting in hypertension (Shapo, 2003).

The results of this study are different from several previous studies, such as those conducted by Arum (2019) which found that the incidence of hypertension was more experienced by adolescent boys (43.7%) than girls (31.0%). Meanwhile, the research of 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, a significant difference in the proportion of hypertension incidence in men and women may be due to smoking habits that are significantly higher in men. The association between cigarettes and an increased risk of cardiovascular disease has been widely proven. In addition to the duration, the greatest risk from smoking depends on the number of cigarettes smoked per day. A person who smokes more than one pack of cigarettes a day has a risk twice as high as 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 atherosclerosis and hypertension. In just a few seconds nicotine has reached the brain.

The brain reacts to nicotine by signaling the adrenal glands to release epinephrine (adrenaline). The hormone will narrow blood vessels and force the heart to work harder due to higher pressure. After smoking only two cigarettes, the systolic and diastolic pressure will increase by 10 mmHg. Blood pressure will remain at this level for up to 30 minutes after you stop smoking. After the effects of nicotine slowly wear off, blood pressure will also decrease slowly. In heavy smokers, blood pressure will be at a high level throughout the day. Passive smoking is also associated with endothelial damage to blood vessels and has an impact on increased blood pressure. Research conducted by Seyedzadeh et al, (2012) shows that exposure to cigarette smoke can increase blood pressure in children and has a risk of cardiovascular disease in the future.

Hypertension 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, if it hits the heart, it is possible to have myocardial infarction, coronary heart, congestive heart failure, if it hits the brain, stroke occurs, hypertensive encephalopathy, and if it hits the kidneys, chronic kidney failure occurs, while if it hits the eyes, hypertensive retinopathy will occur. Of the various complications that may arise, it is a very serious disease and has an impact on the patient's psychology because the quality of life is low, 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 faster 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 taking preventive measures to reduce the risk factors of cardiovascular disease due to hypertension.

COVER

The results of the study showed that of the 147 respondents, one-third had experienced hypertension 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%), 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 to prevent early childhood related to diet and lifestyle in adolescents, including: dietary changes, limiting the use of salt to 4-6 grams per day, foods that contain baking soda, flavorings and food preservatives, reducing foods that contain high cholesterol (offal, egg yolk, squid, shellfish, crab, chocolate, butter, and margarine), quitting smoking habits, Drink alcohol, exercise regularly and don't stress.

BIBLIOGRAPHY

Angesti, AN., Triyanti, Sartika, RAD. 2018. Family History of Hypertension as a Dominant Factor of Hypertension in Adolescents in Grade XI of SMA Sejahtera 1 Depok in 2017. *Health Research Bulletin*. 46(1): 1 – 10;

Arianto. 2013. Health Communication. *Journal of Communication Sciences*. 3(2): 1–13;

Arum, YTG. 2019. Hypertension in the Productive Age Population (15-64 Years). *HIGEIA*. 3(3): 345-56;

Bloch, M. J. 2016. Worldwide Prevalence of Hypertension Exceeds 1.3 Billion *Journal of The American Society of Hypertension*,10(10):753- 754;

Butch, Nirav et al. 2011. Prevalence Of Hypertension In Chool Going Childrenof Surat City, Western India. *Journal of cardiovascular disease research* Oct-Dec; 2(4):

228-232;
Dharnidharka EA. 2015. Hypertension in The Teenager. *Natl Institutes Heal*. 61(1):131– 51;
Fitrianingsih, Siswanto, Y. Tarmali, A. 2016. Several factors related to the incidence of hypertension in adolescents at SMAN 1 Ungaran Semarang Regency. *Journal of Nutrition and Health*. 8(17): 33-39;
Grad, I., Oil and Gas, AM., Pstrusińska, KK. 2015. Factors Associated With Knowledge Of Hypertension Among Adolescents: Implications For Preventive Education Programs In Primary Care. *BMC Public Health*. 15(463): 2-8;
Ministry of Health, R.I. 2013. Basic Health Research. Jakarta: Ministry of Health of the Republic of Indonesia;
Ministry of Health of the Republic of Indonesia 2018, *National Report on Riskesdas 2018*, Jakarta: Ministry of Health of the Republic of Indonesia;
Kini S., Kamath V.G., Kulkarni M.M., Kamath A., Shivalli, S. 2016. Pre Hypertension among Young Adults (20–30 Years) in Coastal Villages of Udupi District in Southern India: An Alarming Scenario. *PLoS ONE*, 11(4);
Kurnianingtyas, BF., Suyatno, Kartasurya, IM., 2017. Risk Factors for Hypertension Incidence in High School Students in Semarang City in 2016. *Journal of Public Health (e-Journal)*. 5(2): 70-77;
Notoatmodjo, Soekijo.2012. *Health Promotion and Health Behavior*, Jakarta: Rineka Cipta;
Nuraini B. 2015. Risk Factors of hypertension. *J Major*. 4(5):10–9;
Park, J.B., Kario, K., and Wang, J.G. 2015. Systolic Hypertension: an Increasing Clinical Challenge in Asi. *Hypertension Research*. 38(4): 227–236;
Price SA, Wilson LM. 2012. *Pathophysiology, clinical concepts, disease processes*, 6th edition. Jakarta: EGC. Sangamesh, V.S. 2016. Prevalence of Hypertension in Urban School Going Adolescents of Bangalore, India. *International Journal of Contemporary Pediatrics*, 3(2): 416 – 423 doi:10.18203/23493291.ijcp20160488;
Santoso, D. 2013. Prevalence of Hypertension in School and College Students. *National Journal of Public Health*. 7(11): 509-513;
Seyedzadeh A, Hashemi F, Soleimani A. Relationship between blood pressure and passive smoking in elementarry school children. Iran J Pediatr. 2012; 22:351-6;
Shapo L, Pomerleau J, McKee M. Epidemiology of Hypertension and Associated Cardiovascular Risk Factors in a Country in Transition. Albania: Journal of Epidemiology Community Health 2003; 57:734–739;
Sukarmin, 2013. *Decrease in Blood Pressure in Hypertensive Patients Through Brisk Wilking Exercise.* Indonesia Journal of Nursing Vol. 16 March 2013;
WHO. 2018. *Global Health Estimates 2016: Deaths by Cause, Age, Sex, by Country and by Region, 2000- 2016*. Geneva: World Health Organization;
Yusrizal, M., Indarto, D., Akhyar, M., 2016. Risk of Hypertension in adolescents with over nutritional status in Pangkalpinang, Indonesia. *Journal of Epidemiology and Public Health*. 1(1): 30-39.