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Research Article

The Relationship Between Knowledge About Hypertension and Dietary Patterns Towards the Incidence of Hypertension in Adolescents in Pangarengan Village, Sampang Regency

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Abstract: Hypertension is a non-communicable disease that is no longer limited to the elderly but has also increasingly affected adolescents. The rising prevalence of hypertension among young people requires serious attention due to its long-term health implications. Poor knowledge and unhealthy eating patterns are known to be significant risk factors for hypertension. This study aimed to analyze the relationship between knowledge of hypertension and dietary patterns with the incidence of hypertension among adolescents in Pangarengan Village, Sampang Regency. This research employed a quantitative approach with a cross-sectional design. A total of 30 adolescents were selected using a total sampling technique. The instruments used included a hypertension knowledge questionnaire, a dietary pattern questionnaire using the SQ-FFQ (Semi-Quantitative Food Frequency Questionnaire), and a sphygmomanometer for measuring blood pressure. The results showed that 50% of respondents had good knowledge, and 40% had healthy dietary patterns. The incidence of hypertension was found in 36.7% of respondents, all classified in the prehypertension category. Bivariate analysis using the chi-square test revealed a significant relationship between knowledge and hypertension incidence ($p = 0.008$), as well as between dietary patterns and hypertension incidence ($p = 0.009$). The study concludes that there is a significant association between knowledge of hypertension and dietary patterns with the occurrence of hypertension among adolescents. Health education and the promotion of healthy eating habits should be strengthened as preventive strategies from an early age.

Keywords: Adolescents; Dietary Pattern; Hypertension; Knowledge.

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1. Introduction

Hypertension is classified as one of the non-communicable diseases (NCDs) that has become a significant global health concern [1]. It is recognized as a major risk factor for cardiovascular disease and is considered one of the most critical medical conditions. Defined as a consistent elevation in blood pressure above 140/90 mmHg, hypertension is often referred to as a "silent killer" due to its asymptomatic nature, which can lead to fatal complications if not managed early. Delayed intervention may result in worsening health outcomes and even mortality [2].

Historically, high blood pressure has been predominantly associated with older adults. However, in recent years, its prevalence among younger populations has been rising significantly. According to the 2023 Indonesian Health Survey (SKI), hypertension prevalence based on direct blood pressure measurements reached 10.7% among individuals aged 18–24, increasing to 17.4% in the 25–34 age group. This trend is alarming, especially considering that hypertension often progresses silently and may cause serious complications without obvious symptoms. These findings highlight that hypertension is no longer an issue exclusive to the elderly but has also become a growing concern among younger, productive

age groups, including adolescents and young adults. As such, early identification and understanding of hypertension risk factors among youth are essential for long-term preventive strategies [3].

Several factors contribute to the development of hypertension. Non-modifiable risk factors include family history, race, age, and gender, while modifiable ones encompass diet, stress, body mass index (BMI), smoking, lifestyle, and eating patterns [4]. Among adolescents, unhealthy lifestyles—particularly poor dietary habits—are the leading contributors to elevated blood pressure [5]. Eating behavior directly affects an individual's nutritional status, as the quality of food and beverages consumed determines nutrient intake, which in turn impacts overall health. Irregular eating patterns, particularly those involving high intake of saturated fat and cholesterol, can significantly raise blood pressure and heighten the risk of developing hypertension [6].

Hypertension can be both prevented and controlled through healthy lifestyle choices, including maintaining a balanced diet. However, inadequate knowledge about hypertension often contributes to its rising incidence. A person's behavior is heavily influenced by their level of knowledge—greater awareness typically leads to healthier habits [7]. Positive behavioral changes can be seen through healthier lifestyle practices, such as limiting high-fat and salty foods, avoiding smoking and alcohol consumption, managing stress, and engaging in regular physical activity [8].

The World Health Organization (WHO) emphasizes that adopting a healthy diet is one of the key strategies to prevent and manage hypertension. This includes regular consumption of fresh fruits and vegetables rich in fiber and potassium, along with reduced sodium intake. Furthermore, it is advised to limit foods high in salt, sugar, alcohol, and caffeine. High sodium content in food can raise blood pressure due to sodium's water-retention properties, which increase blood volume and place additional strain on the heart. Likewise, insufficient intake of potassium-rich foods can result in sodium buildup, further elevating hypertension risk [9].

Among adolescents in the general population, the topics of knowledge and dietary habits are particularly relevant as they directly influence lifestyle choices and eating behavior. Despite this, there is still a lack of research exploring the extent to which knowledge about hypertension and dietary patterns affect hypertension prevalence in youth. Therefore, this study aims to examine the relationship between these two variables in tandem, with the goal of providing a scientific basis for the development of targeted health promotion and disease prevention strategies.

2. Research Methods

This study is a quantitative research with a cross-sectional design. The research was conducted in Pangarengan Village, Sampang Regency, with a total of 30 adolescent respondents. The sampling technique used was total sampling. The independent variables in this study were knowledge and dietary patterns, while the dependent variable was the incidence of hypertension. Knowledge was measured using a hypertension knowledge-level questionnaire, while dietary patterns were assessed using the SQ-FFQ (Semi-Quantitative Food Frequency Questionnaire). Blood pressure was measured using a sphygmomanometer. Blood pressure classification was divided into four categories: normal (systolic <120 mmHg and diastolic <80 mmHg), prehypertension (systolic 120–139 mmHg and diastolic 80–89 mmHg), stage I hypertension (systolic 140–159 mmHg and diastolic 90–99 mmHg), and stage II hypertension (systolic ≥160 mmHg and diastolic ≥100 mmHg) [10]. Data analysis was conducted using univariate and bivariate analysis. Univariate analysis was used to describe the general characteristics of respondents, knowledge, dietary patterns, and the incidence of hypertension, while bivariate analysis aimed to determine the relationship between knowledge and dietary patterns with the incidence of hypertension using the chi-square test.

3. Results

3.1 Respondents overview

This study was conducted in the Pangarengan area, Sampang Regency, with a total of 30 respondents. The general characteristics of the respondents are as follows:

Table 1. Distribution of Respondents' General Overview

No	Variable	Frequency	Percentage (%)
1	Age		
	a. Middle Teens (14-17 years)	13	43,3
	b. Late Adolescene (18-21 years)	17	56,7

2	Gender		
	a. Male	17	56,7
	b. Female	13	43,3
3	Education		
	a. Elementary School (SD)	1	3,3
	b. Junior High School (SMP)	8	26,7
	c. Senior High School (SMA)	21	70,0
4	Occupation		
	a. Student	21	70,0
	b. Enterpreneur	5	16,7
	c. Housewife	4	13,3

Based on the table above, the distribution of respondents is mostly late teenagers (56.7%) and male (56.7%) with the highest education being high school (70%), while the highest occupation is students (70%).

3.2 Overview of Knowledge, Diet, and Hypertension Incidence.

Respondents' knowledge level was measured using a questionnaire on the level of knowledge about hypertension. The questionnaire discussed respondents' knowledge related to hypertension and its management. Diet was measured using the SQ-FFQ (Semi Quantitative Food Frequency Questionnaire) questionnaire which discussed the types and amounts of food consumed including frequency, type, and intake, while the incidence of hypertension was obtained from the results of blood pressure measurements.

Table 2. Distribution of Knowledge, Diet, and Hypertension Incidence

No	Variable	Frequency	Percentage (%)
1	Knowledge		
	a. Good	15	50,0
	b. Not Good	15	50,0
2	Eating Pattern		
	a. Good	12	40,0
	b. Not Good	18	60,0
3	Hypertension Incident		
	a. No Hypertension	19	63,3
	b. Hypertension	11	36,7

Based on the table above, the respondents' knowledge is in the good category (50%) and the bad category (50%), while the respondents' diet is mostly bad (60%). The incidence of hypertension in respondents who are not hypertensive is greater (63.3%). Respondents who experience hypertension are all included in the prehypertension criteria because blood pressure is in the range of systolic pressure 120-139 mmHg and diastolic pressure 80-89 mmHg.

3.3 Relationship between Knowledge and Diet with Hypertension Incidence

The bivariate test used in this study is the chi-square test to determine the relationship between knowledge and diet with the incidence of hypertension. Statistical tests were performed using SPSS.

Table 3. Relationship between knowledge and eating patterns with the incidence of hypertension

No	Variable	Hypertension Incidence		P-*Value*
		No Hypertension	Hypertension	
1	Knowledge			
	a. Good	13	2	0,008
	b. Not Good	6	9	
2	Eating Pattern			
	a. Good	11	1	0,009
	b. Not Good	8	10	

Based on the table above, most respondents have good knowledge and do not experience hypertension, as well as on the diet variable where respondents have a good diet and do not experience hypertension. The results of the bivariate test showed that there was a relationship between knowledge and diet with the incidence of hypertension with a p-value <0.05.

4. Discussion

Hypertension refers to a condition in which blood pressure rises above the normal threshold, specifically exceeding 140/90 mmHg. A diagnosis of hypertension is confirmed when elevated blood pressure readings are recorded twice, five minutes apart, while the individual is at rest and in a stable condition [11]. Adolescents diagnosed with hypertension are at greater risk of continuing to experience high blood pressure into adulthood. The emergence of hypertension in adolescents is associated with several risk factors that can trigger the onset of the condition. These risk factors include non-modifiable factors such as age, sex, and genetic predisposition, as well as modifiable ones like lifestyle habits, daily routines, occupational stress, physical activity levels, and social interactions [5].

A variety of lifestyle-related factors contribute to the development of degenerative diseases such as hypertension among adolescents. These include obesity, family medical history, ethnic background, low birth weight, gender, excessive intake of salt and sugar, smoking habits, physical inactivity, and limited cognitive ability. A lack of adequate health knowledge can lead adolescents to adopt unhealthy behaviors, as personal habits are largely influenced by one's level of understanding. For this reason, adolescents must be well-informed about degenerative diseases in order to take effective preventive measures and avoid exposure to known risk factors [12].

Individuals are expected to enhance their health through knowledge acquisition. Gaining knowledge enables them to access and apply useful information in daily life, which can positively influence their behaviors. Understanding hypertension is especially critical in efforts to prevent and control blood pressure. The greater one's awareness of hypertension, the more likely they are to adopt preventive behaviors and manage the condition effectively [13]. In fact, health literacy is considered a fundamental starting point in any preventive strategy against this disease. Those who comprehend the causes, symptoms, and preventive methods are more likely to take proactive steps in maintaining their health [14].

In addition to knowledge, dietary habits play a key role in the development of hypertension. Dietary patterns involve the frequency and type of food consumed. Consuming excessive amounts of salty, savory, and fatty foods increases the risk of developing hypertension. High sodium intake can disrupt fluid balance in the body, narrowing blood vessels and forcing the heart to pump harder, which in turn raises blood pressure. Similarly, diets high in fat can elevate cholesterol levels, leading to plaque buildup in the arteries. This buildup reduces arterial elasticity and contributes to increased blood pressure [15].

Adolescents often prefer fast food and sugary beverages, both of which contribute to the rising prevalence of hypertension at younger ages. Thus, adopting a healthier diet—including increased consumption of fruits and vegetables, reduced salt intake, and adequate hydration—is essential to lower the risk of hypertension [16]. Previous research has confirmed that poor eating habits are significantly associated with the incidence of hypertension. Individuals with unhealthy diets are more likely to suffer from elevated blood pressure compared to those with balanced diets [17].

Research findings reveal that the majority of respondents exhibit unhealthy eating behaviors, as reflected by their excessive intake of salt and fat. Moreover, many of them eat irregularly in terms of both portion size and food variety. As such, it is recommended that individuals begin to follow nutritionally balanced eating patterns and undergo regular blood pressure screenings at healthcare facilities.

Previous research found a positive correlation between knowledge of hypertension and the practice of healthy eating. Those with sufficient knowledge not only understand the risks but are also more disciplined in maintaining proper nutrition [18]. Adolescence is a critical phase of growth and development during which individuals are exposed to diverse dietary experiences influenced by family and social environments. At this stage, ensuring adequate nutrition is crucial in preventing chronic diseases such as hypertension later in life [5].

Hypertension awareness plays a significant role in both the prevention and management of the disease. Individuals who understand its causes, risk factors, and management strategies are more likely to adopt healthy behaviors, including low-salt diets, regular physical activity,

and routine blood pressure monitoring [19]. Poor eating habits have been strongly linked to increased blood pressure, whereas healthier dietary choices can help reduce the risk. High sodium and saturated fat consumption are known contributors to hypertension. An imbalanced nutrient intake resulting from poor eating patterns can ultimately lead to elevated blood pressure [20].

Both knowledge and diet are central to the occurrence of hypertension. Studies suggest that adequate awareness significantly reduces the likelihood of hypertension, while healthy eating habits contribute to improved blood pressure control. This underscores the importance of early lifestyle interventions—those with sound knowledge are more likely to adopt healthier eating patterns, thereby reducing the risk of developing hypertension from an early age [21].

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