Knowledge, Attitudes and Behavior of Hypertension Prevention in Adolescents in Remote Areas, Indonesia

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Abstract. This study aims to determine the relationship between attitudes and knowledge of adolescent hypertension prevention behaviour. This study used a cross-sectional study design which was conducted in September 2022 on students of the Unika Santu Paulus Ruteng (n=58). The sampling technique used was convenience sampling based on inclusion criteria. Data analysis used bivariate analysis with chi-square. The results showed that most of the respondents had a high level of knowledge as many as 48 respondents (82.8%), had positive attitudes towards hypertension prevention 37 respondents (63.8%), and had good behaviour in preventing Hypertension as many as 47 respondents (81.9%). There is a significant relationship between gender (OR 0.175, 95% CI: 0.041-0.758, p-value 0.013) and knowledge (OR 12.900, 95% CI: 2.689-61.874, p-value 0.000) with hypertension prevention behaviour in adolescents. There is no significant relationship between attitudes (OR 2.560. 95% CI: 0.673-9.737, p-value 0.160) with hypertension prevention behaviour in adolescents. Adolescents with a high level of knowledge have better behaviour in preventing Hypertension. Hypertension education in adolescents needs to be carried out by taking into account the risk factors for Hypertension in adolescents, especially teenage boys, to prevent further impacts of Hypertension.

Keywords: attitude, hypertension, knowledge, preventive behavior

1 Introduction

One of the critical health issues that can lead to death in both developed and developing nations is Hypertension, a non-communicable disease [1]–[3]. According to the World Health Organization (WHO), the number of adults aged 30-79 years with Hypertension has increased from 650 million to 1.28 billion in the last 30 years, and almost half of these individuals do not know that they have Hypertension [4]. The prevalence of Hypertension is increasing in low to middle-income countries. Approximately one in three adults in Southeast Asia suffers from hypertension [2]. Based on basic health research claims that the prevalence of Hypertension at the age above 18 years in Indonesia is 25.8% [5].

In most cases of Hypertension, the leading cause is not detected, which is referred to as essential Hypertension. Essential Hypertension cannot be cured, but with medication, blood pressure can be controlled to a physiological level. However, because Hypertension is usually asymptomatic, the disease can go undiagnosed for a long time [2].

Hypertension does not only occur in adulthood but also adolescence. Hypertension in adolescents in recent years has increased due to obesity, which significantly affects increasing blood pressure [5]. One study on school-age children showed that as many as 27.9% were

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obese, increased blood pressure by 18.4% and increased persistent blood pressure by 2.8% [6]. Adolescent Hypertension has become more common in Indonesia as well. Out of 1200 adolescents, several studies in Indonesia indicated that 8% had Hypertension and 12.2% had rising blood pressure [7]. In the province of East Nusa Tenggara, the prevalence of adolescents aged 18-24 years with Hypertension is 11.54% [7].

Hypertension in adolescents can occur due to various risk factors such as obesity, lack of physical activity, high salt diet, and less consumption of vegetables and fruit [8]. One of the studies conducted in rural areas showed that several risk factors for Hypertension include obesity, age, education, and smoking habits [9]. Another study also conducted in rural areas showed that the risk factors for Hypertension in individuals in rural areas were smoking and alcohol consumption, obesity, overweight and abdominal obesity [10]. Individuals with Hypertension who do not undergo treatment can experience severe complications in vital organs such as the brain, eyes, heart, and kidneys which can be life-threatening and cause disability and death [11], [12]. Based on the literature review, increased blood pressure in adolescents is significantly associated with cardiovascular disease in adulthood. Therefore, adolescents must maintain blood pressure within normal limits [13].

Hypertension in adolescents needs to be prevented to prevent cardiovascular disease in adulthood, which can increase the risk of morbidity and mortality. Prevention of Hypertension in adolescents can be done by reducing body weight in adolescents who are obese and overweight, reducing salt and calorie food consumption, and increasing physical activity [14]. However, according to the findings of earlier studies, many teenagers continue to lead unhealthy lives, such as frequently sleeping late at night, consuming fast food, not exercising, and engaging in various other undesirable behaviours. The utilization of advances in information technology among teenagers makes teenagers spend more time in front of laptops or cell phones, so they rarely do physical activity and exercise. This behaviour can increase the risk of Hypertension in adolescents [15]. This study examines the knowledge, attitudes and behaviour of preventing Hypertension in adolescents in the Manggarai district, one of the remote areas in East Nusa Tenggara Province, Indonesia.

2 Method and Materials

This study used a cross-sectional study design with 58 participants from the Unika Santu Paulus Ruteng on September 2022. A survey method based on criteria was the sampling procedure employed. The first-year Unika Santu Paul Ruteng students who fulfilled the eligibility requirements made up the study's sample. The inclusion criteria were adolescents aged 17-24 years. Exclusion criteria included: having a history of Hypertension and experiencing mental disorders. The independent variables in this study were knowledge and attitudes. The dependent variable is hypertension prevention behaviour. The instrument used is a knowledge questionnaire about Hypertension, an attitude questionnaire towards Hypertension, and a prevention questionnaire for Hypertension [16]. The hypertension knowledge questionnaire consists of the definition of Hypertension, signs and symptoms, diagnosis and treatment, risk factors and prevention of Hypertension [10]. Data analysis used bivariate analysis with chi-square. This research has obtained ethical approval from the ethics committee of the Unika Santu Paulus Ruteng with Number 08/USP/R01/PE02/K/10/2022.

3 Results and Discussion

Table 1. The demographics of the respondents (n-58)

Respondents' traits		n	%
Age (years)	17-22	58	100
Gender	Male	23	39.7
	Female	35	60.3
Family history of Hypertension	Yes	23	39.7
	No	35	60.3
Body Mass Index (BMI)	Underweight	8	13.8
	Normal weight	42	72.4
	Overweight	5	8.6
	Obesity 1	2	3.4
	Obesity 2	1	1.7
Knowledge level	Low	10	17.2
	High	48	82.8
Attitude	Negative	21	36.2
	Positive	37	63.8
Hypertension prevention behaviour	Poor behaviour	11	18.9
	Good behaviour	47	81.1

According to table 1, a percentage of the participants, up to 58 respondents (100%), were female, and up to 35 respondents (60.3%) were in their late adolescent years. Respondents who have a family history of Hypertension are 23 respondents (39.7%). Respondents who have average weight are 42 respondents (72.4%), and five respondents (8.6%) are overweight. Most of the respondents have a high level of knowledge as many as 48 respondents (82.8%), have a positive attitude towards the prevention of Hypertension as many as 37 respondents (63.8%), and have good behaviour in preventing Hypertension as many as 47 respondents (81.9%).

Table 2. Bivariate analysis: Knowledge, attitude and behaviour to prevent Hypertension (n=58)

Variable	Behaviour to prevent Hypertension				Total		OR	95 % CI		P-value
	Poor behaviour		Good behaviour					Lower	Upper	
	n	%	n	%	n	%				
Gender								0.041	0.758	0.013
- Female	3	5.2	32	55.1	35	60.3	0.176			
- Male	8	13.8	15	25.9	23	39.7				
Knowledge level										
- Low	6	10.3	4	6.9	10	17.2	12.900	2.689	61.874	0.000
- High	5	8.6	43	74.1	48	82.8				
Attitude										
- Negative	6	10.3	15	25.9	21	36.2	2.560	0.673	9.737	0.160
- Positive	5	8.6	32	55.2	37	63.8				

Notes: OR: odds ratio; CI: confidence interval.

The results of the bivariate analysis in table 2 show that there is a significant relationship between gender (OR 0.175, 95% CI: 0.041-0.758, p-value 0.013), knowledge (OR 12.900, 95% CI: 2.689-61.874, p-value 0.000) and behaviour prevention of Hypertension in

adolescents. There is no significant relationship between attitudes (OR 2,560. 95% CI: 0.673-9.737, p-value 0.160) with hypertension prevention behaviour in adolescents.

The findings demonstrated that most adolescent respondents indicated positive behaviour in preventing adolescent Hypertension. Several factors that are significantly related to hypertension prevention behaviour in adolescents are gender and level of knowledge. From the results of our study, female adolescents have good behaviour in preventing Hypertension in adolescents than male adolescents, with an odds ratio of 0.176. The findings of this study are consistent with the findings of [17], who revealed an interaction between gender and the reduction of risk factors for high blood pressure. Hypertension risk factor prevention behaviour in women was better than in men (or 3.05, 95% CI: 2.11-4.41, p-value < 0.01) [17]. In our study, male adolescents had poor behaviour in preventing Hypertension because most of the male adolescents had behaviours at risk of developing Hypertension, such as smoking and consuming alcohol. If this kind of behaviour becomes a habit, male adolescents will be at a higher risk of developing Hypertension and other cardiovascular problems than female adolescents. The research results by [18] indicated a significant relationship between increased blood pressure in children and adolescents and the incidence of cerebrovascular disease in adulthood [19].

The adolescent knowledge level is a factor significantly related to adolescent behaviour in preventing Hypertension. Adolescents with a high level of knowledge will have better behaviour in preventing Hypertension compared to adolescents with lower knowledge, with an odds ratio of 12,900. The results of this study are supported by several studies which show that there is a significant relationship between knowledge level and hypertension prevention behaviour [5], [9], [20]. In this study, most adolescents had a high level of knowledge about Hypertension, such as the definition of Hypertension (82.8%), hypertension treatment (69%), hypertension prevention, such as quitting smoking, reducing alcohol consumption, and consuming vegetables and fruit (>86.2%). However, adolescents still have low specific knowledge about Hypertension, such as the majority of adolescents (89.7%) of the opinion that individuals with high blood pressure must have signs and symptoms. In this study, most adolescents had high knowledge of Hypertension, even though they were in rural areas because most of the respondents were late-stage adolescents who were going to young adulthood and were pursuing higher education. This idea affects the intellectual ability of adolescents to understand Hypertension. In addition, these adolescent respondents have high access to information through mass media and the internet. The results of this study contradict one of the studies conducted in rural areas, which states that adolescents in rural areas have a lower intellectual level, so the level of knowledge of adolescents about Hypertension in urban areas is higher than adolescents in rural areas with a p-value of 0.017 which affects the behaviour of preventing hypertension [20].

The study's findings also revealed that most adolescents had a favourable attitude toward reducing Hypertension in adolescence. Nevertheless, there is no strong relation between attitudes and adolescent behaviour to reduce Hypertension. One study found no significant connection between attitudes and Hypertension preventive behaviour, which supports the findings of this study [21]. This concept shows that although adolescents have a positive attitude toward preventing Hypertension, this cannot guarantee adolescents in carrying out hypertension prevention behaviour. For example, most respondents strongly agree that Hypertension can be prevented by quitting smoking and reducing alcohol consumption. However, from the study results, some adolescents still have a habit of smoking and consuming alcohol.

4 Conclusion

Adolescent hypertension awareness has a considerable impact on hypertension-preventative behaviour. Adolescents with a high degree of information about Hypertension will behave better in terms of hypertension prevention than adolescents with a low level of understanding. Adolescent girls have better hypertension prevention behaviour than male adolescents. Health workers need to assess risk factors for Hypertension in adolescents and provide education about Hypertension and prevention of Hypertension in adolescents. The education provided focuses on better lifestyle changes to prevent Hypertension in adolescents in remote areas, such as quitting smoking and alcohol consumption, consuming vegetables and fruit, reducing consumption of foods that are high in salt, and doing physical activity for 40 minutes regularly in 3- 4 days/week. The education provided is expected to change adolescent behaviour in preventing Hypertension from preventing cardiovascular problems in adulthood.

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