

Relationship between Demographic Factors and Body Mass Index with the Prevention of Hypertension in Adolescents

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ABSTRACT

Background: Hypertension or increased blood pressure is often referred as the silent killer, because it usually does not show significant signs and symptoms. Thus, almost all patients do not realize if they suffer from hypertension. The Basic Health Research (Riskesmas) 2007 reported that the prevalence of hypertension in population aged over 18 years old in Indonesia was 31.7%. Because of increasing prevalence of hypertension in adolescence, it is necessary to take precautions. This study aimed to examine relationship between demographic factors and body mass index with the prevention of hypertension in adolescents

Subjects and Method: This was a cross sectional study conducted at Muhammadiyah 1 Senior high school, Yogyakarta, from May 2017 to February 2018. A sample of 80 students was selected for this study. The dependent variables were prevention behavior. The independent variables were age, sex, body mass index (BMI), and residence. The data were collected by questionnaire and analyzed by Chi square.

Results: 48 (60%) students had good hypertension prevention behavior. Female (OR= 3.00; p= 0.030), urban residence (OR= 2.78; p= 0.040), and normal body weight (OR= 4.30; p= 0.001) increased behavior of hypertension prevention, and they were statistically significant. Older age (OR= 1.59; p= 0.220) increased behavior of hypertension prevention, but it was statistically non-significant.

Conclusion: Female, urban residence, normal body weight, and older age increase behavior of hypertension prevention.

Keywords: hypertension prevention behavior, demographic factors

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BACKGROUND

Based on reports of World Health Organization (WHO) 2011, there are 1 billion people in the world who suffering from hypertension. Projected in the coming 2025 around 29% or 1.6 billion of the world's population will suffer from hypertension (Ibrahim and Damasceno, 2012; Lackland and Ram, 2016; Singh et al., 2018). The prevalence of hypertension in Indonesia

has increased from 7.6% in 2007 to 9.5% in 2013. Ministry of Health of Republic of Indonesia 2013 reported that 25.8% or around 65,048,110 Indonesian population suffered from hypertension (Singh et al., 2018). Hypertension in adults is actually already developed since childhood or adolescence. Hypertension is generally considered as adult health problem, however in reality adolescents could also develop

hypertension (Ibrahim and Damasceno, 2012). Ministry of Health of the Republic of Indonesia reported in 2013 the prevalence of hypertension at the age of 15-17 years is 5.3% (Kemenkes RI, 2013).

Long-term and uncontrolled hypertension can cause various complications, such as stroke, heart attack, heart failure, and is a major cause of chronic kidney failure. Hypertension is one of the important risk factors that affect cardiovascular morbidity and mortality (Gao et al., 2016; Navaneethan et al., 2016).

Hypertension is a disease with various causes. The results of the previous study stated that the risk factors for hypertension can be divided into controllable and uncontrollable risk factors. The risk factors that cannot be controlled are family history, sex, and age. Meanwhile, several risk factors can be controlled such as lifestyle (Booth et al., 2017). Lifestyle shifting like eating habit and physical activity shift into fast food and sedentary lifestyle raises a nutritional imbalance in the body which are risk factors for degenerative diseases such as hypertension and other health problems (Rambisa and Indriawati, 2009; Su et al., 2014; Caesarianna and Indriawati, 2016). Seeing the lifestyle shifting and the impact that will occur, it is interesting to study the relationship of adolescents with good and healthy lifestyle patterns, especially the behavior to prevent hypertension.

SUBJECTS AND METHOD

1. Design Study

This was a cross sectional study conducted at Muhammadiyah 1 Senior high school, Yogyakarta.

2. Population and Sampling

The subjects were adolescents aged 14-17 years and attending senior high school. A sample of 80 students was selected for this study randomly.

3. Study Variables

The dependent variable was hypertension prevention behavior. The independent variables were age, sex, BMI, residence, and class major.

4. Operational definition of variables

Age was a long lifetime or existed since a person was born.

Gender was male and female status.

Residence was categorized as urban and rural.

Body mass index (BMI) was a measuring tool used to determine a person's nutritional status specifically related to weight deficiency or fatigue. BMI was categorized as underweight-normal (BMI <18.0 to 25.0) and normal-overweight (BMI ≥ 25.1).

Preventive behavior was a series of actions taken to prevent or detect the initial symptoms of a disease event to improve health and well-being. The treatment is categorized as poor (score <7) and good (score ≥7).

5. Study Instrument

The authors collected the data by asked them to fill a validated questionnaire consisted of questions about their daily activities related to hypertension prevention behavior.

6. Data Analysis

The data were analyzed using Chi Square test.

7. Research ethics

Ethical clearance was issued by the ethic committee of the Faculty of Medicine and Health Science, Universitas Muhammadiyah Yogyakarta, with number: 067/EP-FK-IK-UMY/II/2018.

RESULTS

The distribution of sample characteristics based on age, sex, residence, class major, and body mass index were shown in Table 1. Table 1 showed that out of 80 study subjects, there were 42 (52.5%) aged 14-15

years and 38 (47.5%) aged 16-17 years. There were 20 males (25%) and 60 females

(75%). The study subjects who lived in the urban area were 52 (65%).

Table 1. Sample Characteristics

Characteristic	Category	n	%
Age	a. 14-15 years old	42	52.5
	b. 16-17 years old	38	47.5
Sex	a. Male	20	25
	b. Female	60	75
Address	a. Urban	52	65
	b. Rural	28	35
Class major	a. Science	44	55
	b. Social	36	45
Body mass index	a. Underweight-normoweight	67	83.8
	b. Normoweight-overweight	13	16.2

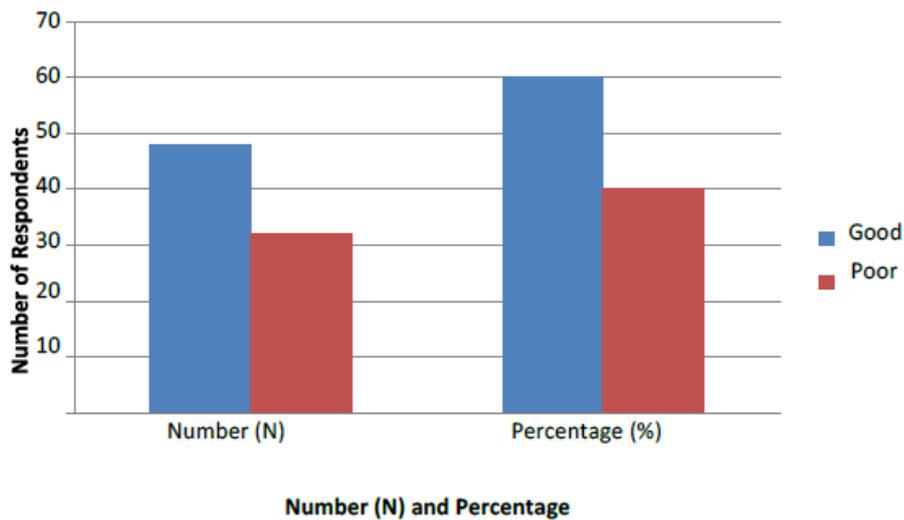


Figure 1. Frequency Distribution of Prevention of Hypertension Behavior

Figure 1 shows that the majority of study subjects had good hypertension prevention behavior (n=48; 60%), meanwhile 32

(40%) had poor hypertension prevention behavior.

Table 2. Bivariate test of demographic factors (age, sex, residence, class, and BMI) and hypertension prevention behavior

Characteristics	Preventive behavior				OR	p	
	Poor		Good				
	N	%	N	%			
Age	14-15 years old	19	59.4	23	47.9	1.59	0.220
	16-17 years old	15	40.6	25	52.1		
Sex	Male	12	15	8	10	3.00	0.030
	Female	20	25	40	50		
Residence	Urban	25	31.2	27	33.8	2.78	0.040
	Rural	7	8.8	21	26.2		
Class major	Natural Science	14	17.5	30	37.5	1.36	0.080
	Social Science	18	22.5	18	22.5		
BMI	Normal body weight	23	71.9	44	91.7	4.30	0.001
	Overweight	29	28.1	4	8.3		

Table 2 showed that female (OR= 3.00; p= 0.030), urban residence (OR= 2.78; p= 0.040), and normal body weight (OR= 4.30; p= 0.001) increased behavior of hypertension prevention, and they were statistically significant. Older age (OR= 1.59; p= 0.220) increased behavior of hypertension prevention, but it was statistically non-significant

DISCUSSION

The bivariate analysis showed that age of the study subjects had no significant relationship to the hypertension prevention behavior in adolescents. This is in accordance with the study by Sri (2015), which stated that age has no relationship with the hypertension prevention behavior. It is also explained in Rana et al. (2016), which showed that there is no significant relationship between age with the hypertension prevention behavior. However, this is not in accordance with the Health Belief Model (HBM) theory which stated that demographic variables such as age, could encourage individuals to take health precautions as recommended (Thornton et al., 2018).

The results of this study showed a significant relationship between the sex of samples with the hypertension prevention behavior. This means that sex differences differed in behavior to prevent the occurrence of hypertension. The results of this study showed that female study subjects had hypertension prevention behavior three times better than male study subjects. This study in accordance with the study conducted by Bocking (2016), which stated that sex had a significant relationship to healthy living behavior. Furthermore, sex differences also affect the pattern of illness in life. In addition, sex is related to the different roles of life and behavior between male and female in society. This is also

supported by the HBM theory which stated that demographic variables such as sex can encourage individuals to take health precautions as recommended (Kautzky-Willer et al., 2016). Unlike, the study conducted by Van Minh (2006) who found that there is no significant relationship between sex differences with hypertension prevention behavior.

The results of this study showed a significant relationship between residence and behaviour of hypertension prevention. Study subjects who were lived in the city/urban had a better hypertension prevention behavior compared to study subjects lived in the rural. This study is in line with the study conducted by Ambaw et al. (2012), who stated that differences in distance and residence and access to health facilities had a significant influence on routine health control habits.

Because of someone who lives in the city will find it easier to reach health facilities and infrastructure to improve their quality of health and quality of life including in illness prevention. Li (2015) described that one of the factors that influence health behavior is the enabling factor, which consists of the availability of health facilities, the ease of reaching health facilities and infrastructure as well as socio-economic and cultural conditions. It cannot be denied if someone lives in urban areas, they will be able to easily access health facilities and infrastructure which can later support them in improving their quality of life, especially in the health sector. However, the results of this study were not in line with Wei et al. (2015), which stated there is no relationship between differences in residence with preventive behavior and routine health control to health facilities.

Another discussion showed no relationship between differences in education

major with hypertension prevention behavior. From the bivariate test results showed that study subjects who took natural science class had hypertension prevention behavior two times better than study subjects who take social science class. However, we found no statistical significance between these variables. In addition, it was not concordant with what is Gupta et al. (2017), stated that one of the dominant factors affecting coping strategies for hypertension is level of knowledge.

A study conducted by Hernandez (2018) also described that the difference in knowledge had a meaningful relationship with the hypertension prevention behavior. The study subjects who taking the natural science class indirectly will know more about the need for healthy living in accordance with the basics of the material they are studying. This study was also not in accordance with the HBM theory which stated that demographic variables such as the type of education can encourage individuals to take recommended precautions.

Buang et al. (2019), stated that someone with better knowledge and maturity towards the process of change itself obtain more positive, objective, and open external influences on various kinds of information, especially health information. Supporting health behavior is strongly influenced by one's knowledge. This knowledge will encourage someone to improve their quality of life by behaving healthy. However, this study is in line with study conducted by Sri (2015), which stated that there is no relationship between differences in types of school and major with hypertension prevention behavior.

There was a significant relationship between BMI and hypertension prevention behavior. Study subjects who had normal BMI had better hypertension prevention behavior four times than those with over-

weight. This is not in accordance with the HBM theory which stated that a person's condition can encourage someone to do an action recommended (Xu et al., 2018; et al., Zhang 2018). Because it should the higher their BMI, the better their lifestyle. Especially is healthy lifestyle in prevention of hypertension (Indriawati and Hartono, 2016; Indriawati and Usman, 2018). This study is not in accordance with the study conducted by Sri (2015), which stated that a person's BMI does not have a significant relationship with hypertension prevention behavior.

AUTHOR CONTRIBUTION

Ratna Indriawati and Syaifudin designed, collected the samples, and conducted the initial analysis. Ratna Indriawati conducted further analysis. Ratna Indriawati and Syaifudin did the manuscript writing.

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CONFLICT OF INTEREST

There is no conflict of interest in this study.

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