

Identification of Modifiable Risk Factors of Hypertension among Undergraduate Students

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Abstract— Hypertension is a major health problem. High prevalence of hypertension contributes to an increase risk of cardiovascular disease which is the first cause of death in the world. In relation to students, they also have risk, such as smoking, consuming alcohol, consuming coffee, stress, consuming high-salt foods, lack of exercise and obesity, so the students have risk factors of hypertension. The aim of this study was to identify modifiable risk factors of hypertension among the undergraduate students of Universitas Muhammadiyah Yogyakarta (UMY). This research used descriptive research method. The sample of this research was 398 students chosen through random sampling method. The data were collected through questionnaire regarding information on stress high sodium diet, exercise habit, alcohol consumption and smoking behavior. The data analysis was done by using frequency distribution program. The results show that the respondents have at risk in hypertension for obesity (10.1%), smoking behavior (19.1%), alcohol consumption (1.8%), coffee consumption (34.4%), excessive salt food consumption (81.4%), stress (81.2%), and exercise habits (74.4%).

Keywords— *Hypertension Risk Factors, Student.*

I. INTRODUCTION

According to [1], High blood pressure is a condition in which the systolic blood pressure is at ≥ 140 mmHg or the diastolic blood pressure is at ≥ 90 mmHg. Among 17.5 million mortality every year, around 9.4 million are caused by hypertension.

The percentage of hypertension in every province in Indonesia with the age of ≥ 18 years old is quite high. In 2013, the research found that hypertension percentage for the age ≥ 18 years old in Indonesia was 25.8%, and in Middle Java was around 26.4% [2].

[3] The age of ≥ 18 years old is categorized as the end of teenager period and the beginning of adulthood. The individuals within this group are college students. They usually age within 18 to 25 years old. Thus, hypertension can happen to them. Hypertension is caused by lifestyle that has a high chance for hypertension, such as high salt food consumption, lack of sports activities, smoking, and stress [4].

[5] A research that conducted at 12 of Universitas Muhammadiyah Yogyakarta's students (31,6%) were experiencing hypertension. Other research shows that among 331 students from the health-related department of

Universitas Hasanudin, 33.5% are experiencing hypertension [6].

Hypertension that happens to college students is mainly caused by unhealthy lifestyle [7]. The lifestyle includes fast food and high salt food consumption, stress, lack of sport exercise, obesity, smoking, coffee consumption, and alcohol consumption.

Food diet with high fat and sodium becomes a favorite within college students. [8] There are 22.0% teenager consumed food containing excessive salt for 3-6 times a week. [9] A study found that 61.9% respondents with excessive salt consumption are experiencing hypertension.

College students are a group of young adult that are prone to experiencing stress. [10] Another research found that 7 (53.8%) among 13 respondents that were in stressful condition experienced hypertension. The researchers also stated that college students had unhealthy habit, i.e. smoking. 27 (87.1%) among 31 students who were smoking experienced hypertension. Someone who smokes has 6.9 higher chance for hypertension.

Other college students' lifestyle is a lack of sports exercise. A research revealed that among 300 respondents who lacked of exercise, 99 respondents (36.1%) experienced hypertension. In the same research, it can be found that college students had an unhealthy lifestyle, i.e. alcohol consumption. Eleven (68.8%) among 16 respondents who consumed ≥ 2 glass/day of alcohol experienced hypertension [11].

Other beverages often consumed by college students are beverages with high caffeine such as coffee. [12] The research found 92 (55.8%) among 165 respondents who consumed coffee experienced hypertension.

Another hypertension risk factor among college students is obesity. It is often found among college students. Another research conducted among Universitas Muhammadiyah Yogyakarta's undergraduate students showed that 26 students (68.4%) had level 1 obesity and 4 students (10.5%) had level 3 obesity [13]. Hypertension cases are often found within respondents who have obesity, i.e. as many as 56.6% [14].

II. METHODS

This research used descriptive design approach. The objective of this research was to identify hypertension risk factors that could be modified among Universitas Muhammadiyah Yogyakarta's undergraduate students. The

sub-variables in this research were smoking habit, alcohol consumption, coffee consumption, excessive salt food consumption, sports activities, and obesity. This research was conducted in August-October 2018. There were 398 respondents from undergraduate students in Universitas Muhammadiyah Yogyakarta who were chosen using accidental sampling method. The data were collected through questionnaire. The data were then processed using distributed frequency to find out the percentage of each hypertension risk factors that could be modified among Universitas Muhammadiyah Yogyakarta's undergraduate students.

III. RESULT

RESEARCH RESULTS

A. Respondents Characteristics

Table 1. Respondents Characteristics

No.	Respondents Characteristics	Frequency (f)	Percentages (%)
1	Gender Female	241	60.6
	Male	157	39.4
2	Age Teenager	85	21.4
	Early Adult	213	78.6
	Total	92	100

Table 1 shows that the number of female respondents is 241 (60.6%), which is higher than the number of male respondents (39.4%). 213 (78.6%) respondents are early adult and 85 (21.4%) respondents are teenager.

B. Modifiable Hypertension Risk Factors

Table 2. Risk Factor Hypertension Distribution

Risk factor hypertension	Risk		No Risk	
	f	%	f	%
Obesity	40	10.1	358	89.9
Smooking behavior	76	19.1	322	81.9
Alcohol Consumption	7	1.8	391	98.2
Stress	323	81.2	75	18.8
Coffe Consumption	137	34.4	261	65.6
Excessive Salt Food Consumption	324	81.4	74	18.6
Exercise habbits	296	74.4	102	25.6

IV. DISCUSSIONS

A. Respondents Characteristics

The age of respondents in this research are categorized at the late stage of teenager that is going to the beginning of adult age, which is at 17-25 years old [15]. In this age, the female has high estrogen hormone that plays a role as a protection hormone from hypertension [16]. Estrogen hormone serves to increase the HDL level. High HDL cholesterol level will prevent atherosclerosis on female [17]. Thus, female has lower hypertension risk compared to male at the same age range.

Male also has some hormones affecting hypertension. Testosterone hormone acts as water and salt retention.

Water and salt that are being held by the body can increase intravascular activity and can increase blood pressure [18].

B. Modifiable Hypertension Risk Factors

1. Obesity

Table 2 shows that most respondents are categorized as at not risk for obesity distribution. This results are in accordance with a research which found that low obesity percentage among health-related department's students is 10.1% [19]. [20] Other research found that only 7.7% of health-related department students experience obesity.

The respondents in this research are health-related department students. Thus, they have better knowledge and understanding on the effects of unhealthy lifestyle. Undergraduate education is considered as a higher education in which students can find information related to health care. The high level of knowledge that the respondents have helps them to pay attention to their lifestyle by controlling body weight and body height ratio. [21] The knowledge that someone has would affect the lifestyle. Knowledge becomes an important aspect of preventing self from diseases.

Low obesity level in this research is experienced by respondents at the late stage of teenager and early stage of adulthood. During this time, respondents pay more attention to their body appearance. Respondents will feel shy if they have obesity. Thus, they pay more attention on their body by avoiding obesity. [22] The late stage of teenager and early stage of adulthood characteristic, they pay more attention on their appearance to build social life within their society and environment. The people at the early stage of adulthood age also pay more attention to their appearance to find a better life [23]. The importance of paying attention to appearance affects body image. Someone that has unideal body shape and obesity will have negative body image [24].

This research also found that 10.1% of respondents are at risk of obesity sub-variable. The low percentage is due to the fact that most of the respondents are students coming from the middle economy family. This affects their lifestyle. Undergraduate students from high economy class tend to consume more junk food or fast food that has high cholesterol and fat. High fat and cholesterol foods become a cause of obesity [25].

The respondents in this research also come from or stay in the metropolitan area. High obesity level is often found in the metropolitan area rather than a rural area [26]. Metropolitan society often consumes junk food and rarely has any heavy physical activities. The researcher also found that the percentage of metropolitan society that has obesity and consume fat of ≥ 1 times/day is at 60.5% while the rural society is at 39.5%. Metropolitan society that has obesity and has low physical activities is at 66.3%. This can be the cause of obesity among some respondents.

2. Smoking Habit

Table 2 shows that the number of respondents categorized at risk is lower than the respondents categorized at no risk. [27] These results are in accordance to other research which found that low percentage of

Faculty of Medicine and Health Care students batch 2013 who become a heavy smoker is at 3.6% and mild smoker is at 1.3%. Another research also found that only 15.09% of the respondents have a smoking habit [28].

Hypertension risk factor caused by smoking habit is low within Universitas Muhammadiyah Yogyakarta students as there are more female respondents than the male ones. Thus, the smoking habit percentage is low. [29] These results are in accordance with the other research which revealed that the percentage of female smoker is lower than male smoker. A male has a higher smoking habit compared to female [30].

Smoking habit is an act conducted by an individual caused by many experiences and interactions in the environments related to cigarette and smoking [31]. One factor causing someone to have a smoking habit is their environment. Someone will become a smoker by imitating the smoking habit within the environments and friends [32]. Many people become a smoker to adjust to the communities or environments [33]. This also becomes the reason why smoking habit distribution is low within this research's respondents. The Faculty of Medicine and Health Care students already know the negative effects of smoking. The faculty also forbids its students to smoke within the university area. Thus, the number of smoker within the environment is low. Therefore, the number of students influenced by friends or environments to smoking is low. Many students surrounded by friends who are not a smoker would lower the chance for them to become a smoker, and vice versa [34].

3. Alcohol Consumption

Table 2 shows that the number of respondents categorized at risk is very low. The results of this study are related to other research who found that 19.1% of the students who were at risk was caused by alcohol consumption [35]. Other research also found that only 6.5% of the students consumed alcohol in their daily lives [36]. Some of the respondents of this study were health students who knew the effects and dangers of consuming too much alcohol. [37] Education influences one's knowledge. Someone who has a higher level of education will have better knowledge. The higher level of knowledge will make a person maintain a healthy diet and lifestyle. Knowledge is also something that will help determine how a person behaves. A person will act based on his knowledge [38].

4. Stress

As presented on Table 2, it can be seen that the majority of research respondents is categorized as at risk (81.2%). This is because UMY students have many assignments, undergo lectures with difficult material, have tight exam schedules, and have fewer rest periods, resulting in many health students who have high stressors and suffer from stress. The stress levels that occur among medical and health students are very high compared to other study programs in the non-medical sector [39].

The causes of stress among students stem from academic life, namely external demands and internal demands. External demands come from college

assignments, lesson load, family, environment, facilities, lecturers, and social adjustment in the campus. These demands also include competencies in lectures and complexity of lecture materials that are increasingly difficult. Various external and internal demands that the respondents of this study have also become one of the factors in the high percentage of stress in this study [40].

5. Coffee Consumption

Table 2 indicates that respondents categorized as at risk in the distribution of coffee consumption are minority (34.4%). The results of this study are consistent with other study which found that students who consumed coffee daily were 1 time a day (69.2%), 2 times a day (23.1%), and 3 times a day (7.7%) [41]. This means that the percentage of coffee consumption among the students is dominated by the categories of at no risk.

The majority of the respondents was categorized as not at risk in this study because some of the respondents in this study were health students who knew the impact of consuming too much coffee. Another factor that affects the low percentage of students at risk in this study is because most of the respondents were female, so the level of consumption of coffee was smaller than that of men. This is consistent with the research which revealed that men tend to consume coffee more often than women [42].

6. Excessive Salt Food Consumption

In table 2, it can be seen that most respondents are categorized at risk (81.4%) in the excessive salt consumption factor. The majority of respondents live at boarding house and prefer fast food as it has a lower price and it does not take too much time to prepare. [43] Most students do not live with their parents and those who live in a boarding house tend to consume fast food. The teenagers who live in a boarding house consume fast food more than 1 time per week [44]. Other research revealed that 81.8% health care related departments undergraduate students tend to consume junk food [45].

The respondents in this research are mostly from department that have a hectic schedule. Thus, they don't have many options on food. [46] Undergraduate students who have hectic schedule will have a short time for breakfast and lunch. Because of these reasons, they tend to consume fast food. Other research showed that 75% of undergraduate students consume fast food with excessive salt, and only 18.75% consume homemade food.

7. Exercise Habits

Table 2 shows that the majority of the respondents are categorized at risk for exercise habits. [47] The research found that 35.4% health care students do not have enough physical activities. Other research revealed that 41.3% undergraduate students have a low frequency of sports activities, and only 5% have a high frequency of sports activities [48].

The teaching and learning activities at Universitas Muhammadiyah Yogyakarta are hectic, therefore, the students do have enough time to do physical activities. Universitas Muhammadiyah Yogyakarta have hectic

schedules that cause students to have limited time for themselves, such as sports activities [49].

The majority of the respondents in this research are female. This can also be a factor affecting the high percentage of students with at risk category. Female students rarely do heavy activities, such as sports. The most physical activities conducted by the male are heavy activities. This causes female to have a higher risk at sports activities distribution factor [50].

V. CONCLUSION

Hypertension risk factors that can be modified according to sub-variables are obesity, smoking habit, alcohol consumption, and coffee consumption which are categorized as at no risk. Meanwhile, hypertension risk factors with sub-variables are stress, excessive salt food consumption, and sports activities majority which are categorized as at risk.

VI. SUGGESTIONS

This research is expected to provide basic data on hypertension risk factors among people of late teenager and early stage of adulthood. Further research needs to be conducted as continuation research or education for undergraduate students so they will have a healthy lifestyle and avoid hypertension later in life.

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