

CORRELATION OF OVERWEIGHT AND OBESITY WITH HYPERTENSION IN THE PRODUCTIVE AGE GROUP IN PALU CITY

Fransisca R Octavia¹⁾, Dyana Sarvasti²⁾, Yudita Wulandari³⁾

DOI: <https://doi.org/10.33508/jwmj.v5i1.4418>

ABSTRACT

Introduction: Data from the Central Sulawesi Health Office also shows that health services for people with hypertension in Palu City were 25.9% in 2019. In 2017 the prevalence of obesity in Palu City was quite high, with a prevalence of obesity cases of 19.85%. The high incidence of hypertension in Central Sulawesi Province is still not controlled and is closely related to unhealthy lifestyles, overweight and obesity.

Purpose: To find out the nutritional status of overweight and obesity in the productive age group, find out the incidence of hypertension in the productive age group, find out the characteristics of each research respondent, and analyze the correlation between overweight and obesity with the incidence of hypertension in the productive age group.

Method: This research is an observational analytic study with a cross-sectional approach. The sampling technique of non-probability sampling is consecutive sampling. The research population is people of productive age (15-64 years). As many as 62 respondents who are in Maesa area, Balaroa, and Petobo shelter areas in Palu City. The variables in this study, namely overweight, obesity and hypertension, are included in the nominal scale. In this study, the correlation test between variables will be carried out with a contingency coefficient test. The correlation between variables is considered significant if the p-value <0.05 is obtained.

Result: The correlation between overweight and obesity with hypertension was not statistically significant ($p=0.293$). The correlation value of 0.132 indicates a very weak correlation strength and is not clinically significant.

Conclusion: There is no correlation between being overweight and obesity with the incidence of hypertension in the productive age group.

Keywords: *overweight, obesity, hypertension, and productive age.*

¹⁾Student of Medical Faculty Widya Mandala Catholic University Surabaya, Kalisari Selatan No. 1 Surabaya, e-mail: med.fransisca.r.18@ukwms.ac.id

²⁾Department of Internal Medicine, Heart, and Lung, Faculty of Medicine, Widya Mandala Catholic University Surabaya, Kalissari Selatan No. 1 Surabaya

³⁾Department of Internal Medicine, Heart, and Lung, Faculty of Medicine, Widya Mandala Catholic University Surabaya, Kalissari Selatan No. 1 Surabaya

INTRODUCTION

Hypertension in the world has not been controlled optimally, but every health service strives to prevent and treat the incidence of hypertension.¹ Data from the World Health Organization (WHO) in 2015 showed that around 1.13 billion people in the world suffer from hypertension, so it can be concluded 1 in 3 people in the world suffer from hypertension.²

Data from the Central Sulawesi Health Office also shows that health services for people with hypertension in Palu City were 25.9% in 2019.³ The high incidence of hypertension in Central Sulawesi Province is closely related to people's lifestyles, which generally tend to be less physically active, have a low fiber diet, excessive salt consumption, obesity, dyslipidemia, and stress.³

Body mass index (BMI) is an anthropometric measurement that is easy and simple to determine a person's nutritional status.⁴ Factors that influence BMI are age, gender, physical activity, genetics, and diet.^{5,6}

Hypertension is an increase in systolic blood pressure 140 mmHg and/or diastolic blood pressure 90 mmHg.⁷ In 2019, cases of hypertension in Central Sulawesi were 51.2%. Palu City has a hypertension prevalence of 25.9%.³ Hypertension can be influenced by several factors, namely age, race, gender, genetics, obesity, smoking, excessive salt consumption, alcohol, dyslipidemia, lack of physical activity, and stress.¹

An increased body mass index is associated with the incidence of hypertension. If a person is overweight and obese, the risk of atherosclerosis and heart work will be heavier. Overweight and obese patients require a greater supply of oxygen in the body. This results in the heart contracting more often to supply oxygen to the body's cells. Excessive heart work causes an increase in blood pressure.^{8,9}

Based on the understanding that has been presented, researchers are interested in learning more about the correlation between

overweight and obesity with hypertension in productive age in Palu City.

METHOD

Tools and Materials

The data of this research were obtained by conducting a direct examination of the respondents. The tools and materials included writing instruments, a Littmann Classic III stethoscope, a Camry weighing scale, a GEA Medical Microtoise Staturmeter, and an ABN spring sphygmomanometer.

Data Collection

This study uses a consecutive sampling method to collect data until the minimum sample size is met. The population of this study was people of productive age (15-64 years) in Palu City who met the inclusion and exclusion criteria. The minimum sample size in this study was 34 samples. In this study, the inclusion criteria were being willing to be a respondent, aged 15-64 years, overweight and obese nutritional status, getting a good night's sleep, and being calm or not restless. Meanwhile, the exclusion criteria were having a history of hypertension, pregnancy, sports, taking antihypertensive drugs, taking birth control pills or stimulant drugs, having a history of hormonal disorders, diabetes mellitus, heart problems, consuming caffeine, and doing sports 30 minutes before the examination. The research was carried out at Maesa Housing, Balaroa Shelters, and Petobo Shelters in Palu City from 17 July - 4 August 2021.

Data Analysis

Researchers analyzed the correlation between overweight and obesity with hypertension in the productive age group in Palu City. In this study, the correlation test between variables will be carried out with a contingency coefficient test. The correlation between variables is considered significant if the p-value <0.05 is obtained.

RESULT

Overall respondents who participated in this study were 62 respondents. The following characteristics of respondents who participated in the study are listed in Table 1.

Table 1. Characteristics of Research Respondents

Characteristics	n=62
Age n (%)	
15-24	35(56)
25-34	6(10)
35-44	7(18)
45-54	10(16)
55-64	4(6)
Gender n (%)	
Male	37(59)
Female	25(41)
Profession n (%)	
Student	23(37)
Housewife	15(24)
Entrepreneur	17(28)
Government employees	2(3)
Private employees	5(8)
Exercising n (%)	35(56)
Never exercise in a week	27(44)
1-3x/week	
Smoking habit n (%)	19(31)
Smoking	43(69)
Do not smoke	

Based on Table 1, it is known that the most respondents who participated in this study were those with an age range of 15-24 years, were male, and had the status of a student. Respondents who participated more had never exercised in a week and did not smoke.

Table 2. Distribution of Respondents Based on Body Mass Index (Overweight and Obesity)

Body Mass Index	Amount (n)	Percentage (%)
Overweight	28	45
Obesity	34	55
Total	62	100

Based on Table 2, the number of respondents with a body mass index of overweight (45%) is less than that of obese respondents (55%).

Table 3. Distribution of Respondents Based on Hypertension and Non-Hypertension

Blood Pressure	Amount (n)	Percentage(%)
Hypertension	52	84
No Hypertension	10	16
Total	62	100

Based on table 3 respondents who have hypertension (84%) are more than respondents who do not (16%).

Table 4. Results of Analysis of the Relationship between Body Mass Index (Overweight and Obesity) with the Incidence of Hypertension

BMI	Hypertension		Correlation Coefficient (r)	P Value
	Hyper-tension	No Hyper-tension		
Overweight n(%)	25 (89,3)	3 (10,7)	0,132	0,293
Obesity n(%)	27 (79,4)	7 (20,6)		
Total	52 (83,9)	10 (16,1)		

Table 4 shows that respondents who are overweight and obese are more likely to have hypertension, with a percentage of 89.3% and 79.4%, respectively. It is known in this study that the correlation value of 0.132 indicates a very weak correlation strength and is not clinically significant. So based on the contingency coefficient test, the correlation between overweight and obesity with hypertension was not statistically significant ($p = 0.293$).

DISCUSSION

Overweight and obesity conditions cause the heart to work harder to meet the supply of oxygen for the body's cells so that the heart will contract continuously, the heart rate will increase, and there will be an increase in blood pressure. In addition, atherosclerosis can occur, which impacts endothelial damage to blood vessels and causes reduced nitric oxide production, so blood vessels tend to vasoconstriction, which increases blood pressure.^{8,9}

In this study, more respondents were obese than respondents who were overweight. Lack of education to the public about the importance of maintaining an ideal body weight, so that people continue to eat unbalanced foods, can be one of the causes. People who do not know the causes or effects of being overweight and obesity

on health are likely to continue to lead an unhealthy lifestyle as before.¹⁰

In diagnosing hypertension in respondents, researchers conducted repeated blood pressure checks for three visits with a distance of each visit for two days, then took the average of the three examinations. There are more overweight and obese respondents diagnosed with hypertension than respondents who are not diagnosed with hypertension. However, the results of the correlation analysis of overweight and obesity with hypertension in the productive age group had a p-value of 0.293 ($p < 0.05$), which means the study's results were not significant.

The insignificant correlation between overweight and obesity with hypertension in this study may be caused by confounding factors that are difficult to control. The possible confounding factor is the age of the respondents who participated in this study. In this study, it is known that the age of the participating respondents is 15-24 years. In general, at the age of young adults, hypertension is still quite low. This is because, at a young age, the elasticity of the blood vessels is still good so that the function of the blood vessels can still work optimally in vasodilation. In addition, in young adulthood, the function of the baroreceptors responsible for regulating blood pressure is still functioning optimally.¹¹

Another confounding factor that might cause this study to be insignificant is the habit of the dominant respondent not smoking. If you don't smoke, the risk of suffering from hypertension will be reduced. This is because blood pressure, heart rate, and peripheral blood flow improve. A person who smokes is more prone to suffer from hypertension. The acute effect caused by smoking is that the content in cigarettes can increase heart rate and blood pressure with increased levels of the hormone epinephrine due to activation of the sympathetic nervous system.¹²

Confounding factors that may be the cause of hypertension in respondents that

cannot be controlled by the researcher, such as the age of the respondent, who is predominantly 15-24 years old, and the habit of the respondent, which is dominantly not smoking. This confounding factor is a limitation that may be the cause of the insignificant correlation between overweight and obesity with hypertension in this study.

CONCLUSION

There is no correlation between being overweight and obesity with the incidence of hypertension in the productive age group.

Several possibilities that cause the study's results to be insignificant are confounding factors that influence the condition of hypertension, in addition to being overweight and obese. The possible confounding factors are the age of the research respondents, where the respondents who participated in the dominant study were 15-24 years old, and the habit of respondents who did not smoke.

REFERENCES

1. Susetyo Pikir B, Leonard E. Hipertensi manajemen komprehensif. Surabaya: Universitas Airlangga; 2015.
2. Whitworth JA. World Health Organization (WHO)/International Society Of Hypertension (ISH) Statement On Management Of Hypertension. 2003. Journalfile:///Users/sharyoctavia/Downloads/2003-world-health-organization-whointernational-society-of-hyper-2003.pdf of Hypertension. 2003.
3. Dinas Kesehatan Sulawesi Tengah. Profil kesehatan Sulawesi Tengah tahun 2019 [Internet]. 2019. Available from: <https://dinkes.sultengprov.go.id/wp-content/uploads/2018/06/profil-Dinkes-Sulteng-TA.-2019.pdf>
4. Supariasa IDN. Penilaian status gizi. Edisi 2. Jakarta: Kedokteran EGC; 2014.
5. Pradana A. Hubungan antara indeks massa tubuh dengan nilai lemak visceral. J Media Med Muda [Internet]. 2014;3(1):6–15. Available from: <https://media.neliti.com/media/publications/108562-ID-hubungan-antara-indeks-massa-tubuh-imt-d.pdf>
6. Utami D, Setyarini GA. Faktor-faktor yang mempengaruhi indeks massa tubuh pada remaja usia 15-18 tahun di SMAN 14 Tangerang. J Ilmu Kedokt Dan Kesehat [Internet]. 2017;4(3):207–15. Available from: <http://ejournalmalahayati.ac.id/index.php/kesehatan/article/viewFile/1318/1043>
7. Kemenkes RI. Infodatin hipertensi. 2014;(Hipertensi). Available from: https://www.google.co.id/url?sa=t&rcct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0ahUKewjIzfDJsYPKAhVSA44KHUmSDasQFggZMAA&url=http://www.depkes.go.id/download.php?file=download/pusdatin/infodatin/infodatin-hipertensi.pdf&usg=AFQjCNHWLiHieCeL1Ksg4Tr_yx
8. Meiliana A, Dewi NM, Wijaya A. Advanced in molecular mechanisms of atherosclerosis: from lipids to inflammation. Indones Biomed J [Internet]. 2018;10(2):104–22. Available from: https://www.researchgate.net/publication/326784645_Advanced_in_Molecular_Mechanisms_of_Atherosclerosis_From_Lipids_to_Inflammation
9. Wolf D, Stachon P, Bode C, Zirlik A. Inflammatory mechanisms in atherosclerosis. Hamostaseologie [Internet]. 2014;34(1):63–71. Available from: https://www.researchgate.net/publication/259349686_Inflammatory_mechanisms_in_atherosclerosis
10. Dinkes Sulteng. Profil kesehatan Sulawesi Tengah tahun 2017. 2017;1–5. Available from: <https://dinkes.sultengprov.go.id/wp-content/uploads/2018/06/2017.pdf>
11. Widjaya N, Anwar F, Laura Sabrina R, Rizki Puspawati R, Wijayanti E. Hubungan usia dengan kejadian hipertensi di Kecamatan Kresek dan Tegal Angus, Kabupaten Tangerang. Yars Med J [Internet]. 2018;26(3):131. Available from: <https://academicjournal.yarsi.ac.id/index.php/jurnal-fk-yarsi/article/view/756>
12. Umbas IM, Tuda J, Numansyah M. Hubungan antara merokok dengan hipertensi di Puskesmas Kawangkoan. J Keperawatan [Internet]. 2019;7(1). Available from: <https://ejournal.unsrat.ac.id/index.php/jkp/article/download/24334/24002>