
Analysis Of Modifiable Risk Factors For The Incidence Of Hypertension In Adults (18–65 Years) In Students Of The Public Health Science Study Program, University Of Jambi

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Abstract

Hypertension is a non-communicable disease that is a major risk factor for cardiovascular disease and is often unaware of it. Adult age groups, including college students, are at risk of developing hypertension due to lifestyle changes and stress-inducing academic stress. This study aims to determine the determinants of risk factors that can be modified for the incidence of hypertension in students of the Public Health Sciences Study Program, University of Jambi. This study uses a quantitative approach with a cross sectional design. The sample amounted to 60 respondents who were selected using the purposive sampling technique. The variables studied included obesity, smoking behavior, stress levels, and sodium consumption. Data were collected through questionnaires and analyzed univariate and bivariate. The results showed that the majority of respondents had normal nutritional status (93.3%), non-smoking (96.7%), and normal sodium consumption (98.3%). The prevalence of hypertension is only 1.7%. However, the stress level is quite high, which is 53.3%. Stress factors are the most dominant determinants compared to other factors. The conclusion of this study shows that although physical factors are relatively controlled, psychosocial factors such as stress play an important role in the potential occurrence of hypertension. Therefore, promotive and preventive interventions are needed, especially in stress management in students.

Keywords: Hypertension, Obesity, Stress, Sodium Consumption, College Students.

INTRODUCTION

Hypertension is one of the non-communicable diseases whose prevalence continues to increase globally and nationally. This disease is known as the *silent killer* because it often shows no symptoms in the early stages, but it can lead to serious complications such as heart disease, stroke, and kidney failure. In Indonesia, the prevalence of hypertension is still high and many cases have not been diagnosed. This shows that hypertension is still a serious public health problem. In addition, lifestyle changes such as consumption of high-salt foods, lack of physical activity, smoking, and stress are the main factors that contribute to the increased incidence of hypertension. Students as a productive age group have their own risk of hypertension. Academic stress, unhealthy lifestyles, and changes in daily habits can increase modifiable *risk factors*, such as obesity, smoking, sodium consumption, and stress. Based on this background, this study aims to analyze the determinants of *risk factors that can be modified* for hypertension in students of the Public Health Science Study Program, University of Jambi.

RESEARCH METHODS

This study is a quantitative research with *a cross sectional design*. The use of this design aims to analyze the relationship and distribution of these risk factors in the productive age group within the Public Health Sciences Study Program, Faculty of Medicine and Health Sciences, University of Jambi. With this approach, researchers can obtain a comprehensive picture of the prevalence of risk factors and their relationship with the blood pressure status of the respondents efficiently. The population in this study is all active students, with a sample of 60 respondents selected using *purposive sampling techniques*. With inclusion criteria:

- a. Student of Public Health Science Study Program, University of Jambi.
- b. Aged 18-65 years old when the study was conducted.

And the exclusion criteria:

- a. Respondents who are not willing to be research respondents
- b. Respondents who have a genetic disease.

Independent variables included: Obesity, Smoking behavior, Stress level, and sodium consumption
 Data collection was conducted using the Riskesdas 2018 questionnaire, *24-hour food recall*, and *Depression, Anxiety, and Stress Scale 42 Questionnaire (DASS-42)*. Data analysis was carried out univariate and bivariate using *the chi-square test* with a significance level of 0.05.

RESULTS AND DISCUSSION

Based on the data in the table, it can be concluded that 60 respondents who showed the characteristics of respondents based on age were the most numerous, namely the 19-year-old age group with a total of 36 respondents (60%) and the fewest was the 18-year-old age group with a total of 5 respondents (8.3). The characteristics of respondents based on gender were mostly dominated by women totaling 55 respondents (91.7%). The characteristics of respondents based on family history of hypertension were 15 respondents (25%) and those who did not have a family history of hypertension amounted to 45 respondents (45%). And for the characteristics of blood pressure, respondents who were declared hypertension amounted to 1 respondent (1.7%).

No	Features	N	Percentage (%)
1	Age (Years)		
	18	5	8,3
	19	36	60
2	Gender		
	Male	5	8,3
	Women	55	91,7
3	Family History		
	Ya	15	25
4	Blood Pressure		
	Hypertension	1	1,7
	No Hypertension	59	98,3

Table 1. Distribution of Respondent Characteristics

NO	Variabel	Frequency (n)	Percentage (%)
1	Obesity		
	Overweight	4	6,7
	Normal	56	93,3
2	Smoking Behavior		
	Smoking	2	3,3
	Dilarang Merokok	58	96,7
3	Stress levels		
	Stress	32	53,3
	No Stress	28	46,7
4	Sodium consumption		
	Height	1	1,7
	Normal	59	98,3

Table 2. Modifiable Risk Factor Distribution for Hypertension Occupational

DISCUSSION

The results of the study show that the prevalence of hypertension in college students is relatively low. This can be caused by the respondent's physical condition that is still good, characterized by normal nutritional status if associated with the literature from Fatma et al. (2021), obesity is one of the main risk factors that can be changed in the incidence of hypertension. This is because the accumulation of excess fat in the body increases the workload of the heart and triggers the narrowing of blood vessels, which gradually increases systemic blood pressure. Although the percentage of respondents with obesity was relatively small, the productive age group in the 18 to 20 years range in this study still had long-term health risks if their lifestyle was not maintained. The results of data analysis showed that most of the respondents were in the non-smoking category, namely 58 people (96.7%), while respondents who had a history of smoking only amounted to 2 people (3.3%). Of the group that had a history of this, 1 person still smoked with occasional intensity, and 1 other person had quit. All respondents who smoke have relatively low cigarette consumption, which is less than 5 cigarettes per day with a smoking duration of less than one year. These findings show that active exposure to cigarette smoke in the productive age group in this study environment is classified as very low. Nevertheless, high levels of stress were an important finding in this study. Stress can trigger an increase in blood pressure through hormonal mechanisms and the activity of the sympathetic nervous system. This condition, if it persists in the long term, can increase the risk of hypertension. The high level of stress in respondents (53.3%) is in line with the findings of Ayu et al. (2022) who identified stress as one of the significant psychological risk factors for the incidence of hypertension. In the study, it was explained that stress conditions trigger the activation of the sympathetic nervous system and the hypothalamic-pituitary-adrenal axis, which then increases the frequency of heart rate and vasoconstriction of blood vessels. The dominance of the "Stress" category in this study (32 respondents) strengthens the argument that psychosocial factors are crucial variables that need to be watched out. In addition, although sodium consumption is normal, other lifestyle factors such as lack of physical activity and academic stress still have the potential to increase the risk of hypertension in the future. The results of this study are in line with the theory that psychosocial factors have an important role in the incidence of hypertension, especially in the productive age group.

Limitations

This research has several limitations that can affect the results, the limitation is that this research is only carried out in a limited scope, namely one group of students in one study program at

the University of Jambi. The specific demographic characteristics of this group mean that the results of the study cannot be generalized to represent the student population at other institutions or the wider community. There is a potential bias in the results of sodium intake because there are several questions on the questionnaire that state that it is based on confession so that it is usually only based on the respondent's memory and can affect the validity of the results of this study.

CONCLUSION

Based on research that has been conducted on students of the Public Health Science study program at the University of Jambi in 2026, the researcher draws the following conclusions:

1. This study was obtained from the productive age group who experienced obesity (6.7%), smoking behavior (3.3%), stress level (53.3%) and who consumed sodium (1.7%).
2. There is a relationship between obesity and the incidence of hypertension of productive age in students of the Public Health Science study program.
3. There is a relationship between smoking behavior and the incidence of hypertension of productive age in students of the Public Health Science study program.
4. There is a relationship between stress levels and the incidence of hypertension of productive age in students of the Public Health Sciences study program.
5. There is a relationship between sodium consumption and the incidence of hypertension of productive age in students of the Public Health Science study program.

REFERENCES

- Abdillah MN, Sommeng F, Nur MJ, Tahir AM. Risk factors for the incidence of hypertension in young adulthood at Ibnu Sina Makassar Hospital. 2025; 12(2):75–86.
- Anisa SR, Debora O, Sulartri AS, Malang PW. Physical activity is related to the regulation of blood pressure in hypertensive patients at the Puskesmas Kota X. *J Health Sciences*. 2025; 13(2):265–71.
- Ardyanti NLY. *The Relationship between Hypertension Knowledge Level and Self Management in Hypertension Patients in the Work Area of UPTD Puskesmas Mengwi II*. Denpasar: Bali Institute of Technology and Health; 2021.
- Ayu D, Sinaga AF, Syahlan N, Siregar SM, Sofi S, Zega S, et al. Factors that cause hypertension in Medan Southeast Village. 2022; 10:136–47.
- Destriatania S, Febry F. Risk Factors for Hypertension in Seri Tnajung Village, Tanjung Batu District. *J Health Sciences Masy*. 2025; 6(3):202–10.
- Dewati CA, Natavany AR, Putri ZM, Nurfaizi A, Rumbrawer SO, Sri Rejeki DS. Literature Review: Risk Factors for Hypertension in Indonesia. *J Health of Masy*. 2023 May 31; 11(3):290–307.
- Fatma M, Eros E, Suryati S, Badriah S, Rizqi S, Fahira N, et al. **H I P E R T E N S I: RECOGNIZE THE CAUSES, SIGNS OF SYMPTOMS AND THEIR TREATMENT**. 2021.
- Indonesian Hypertension Doctors Association. *Guidelines for the Introduction and Management of Resistant Hypertension in Indonesia*. Jakarta: Indonesian Society of Hypertension; 2024.
- Isafil, Yusuf A, Efendi F. *Hypertension, Cardiovascular Complications and Their Prevention*. Airlangga University; 2023.
- Luh N, Ekarini P, Wahyuni JD, Sulistyowati D. Factors related to hypertension in adulthood. *JKEP*. 2020; 5(1):61–73.
- Meo MY, Paulus Y, Rangga P, Ovi F, Meo MY, Paulus Y, et al. Family Support and Implementation of Self Care Management In Elderly with Hypertension. *J Suitability*. 2023; 12(1):34–40.
- Ministry of Health of the Republic of Indonesia. *Indonesian Health Survey (SKI)*. Jakarta; 2023. 1–68 p.

- Ministry of Health. Technical Guidelines for the Diagnosis and Management of Hypertension. 2013.
- Nurhaeni A, Aimatun Nisa N, Marisa DE. Literature Review of the Relationship between Smoking and the Incidence of Hypertension. *J Health Mahardika*. 2022 Nov 1; 9(2):46–51.
- Ramadhan C, Fazriana E, Heart A, Adult U. The Relationship between Obesity and the Incidence of Hypertension in Adulthood UPTD Babakan Sari Health Center, Bandung City. 2023; 2(1).
- Vinola J. Factors related to the incidence of hypertension in the working area of the East Tomoni Health Center, East Luwu Regency. Hasanuddin University; 2023.
- WHO. Global report on hypertension 202. 2025.