



The Correlation Between Nutritional Status and The Incidence of Hypertension in Productive Age

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Abstract

Hypertension is when blood vessels have high blood pressure, systolic blood pressure ≥ 140 mmHg or diastolic blood pressure ≥ 90 mmHg. The prevalence of hypertension globally is 22% of the total world population. Basic health research 2018 reported that the incidence of hypertension was 34.1%. The Jambi City Health Office reported the number of hypertension cases at 25,846 cases, and data from the Simpang IV Sipin Health Center in Jambi City showed the number of people with hypertension in January-March as many 652 cases. This study aims to determine the factors associated with the incidence of hypertension in productive age at the Simpang IV Sipin Health Center in Jambi City. The design used in this study is a quantitative research with a cross sectional approach. This research was conducted at the Simpang IV Sipin Health Center in January-June 2023. The population in this study is patients who visited the Simpang IV Sipin Health Center, with a total of 96 people in January-March 2023. The sample amounted to 53 respondents. The sampling technique is accidental sampling. The data analysis used was univariate and bivariate analysis using chi-square statistical test. The results of this study are that there is a relationship between nutritional status (0.022) with the incidence of hypertension in productive age at the Simpang IV Sipin Health Center. In this study, it can be concluded that there is a relationship between nutritional status and the incidence of hypertension at productive age, so the researchers recommend that the Simpang IV Sipin Health Center in Jambi City provide health education to hypertension sufferers with the theme "Ideal body weight as a first step in preventing and treatment of hypertension".

Keywords: Hypertension, Productive Age, Nutritional Status.

Key Messages:

- In the productive age, hypertension can also occur which can be caused by several factors and can have impacts in the future.
- It is very important for the productive age population, especially the working population, to pay attention to their health and avoid adopting an unhealthy lifestyle

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1. Introduction

Hypertension according to the World Health Organization (WHO) is a condition where the blood vessels

have persistent high blood pressure, systolic blood pressure ≥ 140 mmHg or diastolic blood pressure ≥ 90 mmHg. Blood pressure is the force of the blood to resist the pressure of the artery walls when the blood is pumped by the heart throughout the body (1). The global prevalence of hypertension is 22% of the world's total population (2). Basic Health Research (Riskesdas) 2018 reported that in Indonesia the prevalence of hypertension was 34.1%. And data obtained from the 2020 Jambi Provincial Health Service Profile shows that of the 10 most common disease patterns in Jambi Province health centers in 2016-2020, hypertension is in first place with a case percentage of 23.63% in 2020 (3). Based on the 2021 Jambi City Health Service report, it is known that the number of hypertension cases in Jambi City was 25,846 cases. Where the highest cases in 2020-2021 were at Simpang IV Sipin Health Center with the number of cases in 2020 amounting to 2,115 and in 2021 amounting to 5,511 cases (4). According to Triyanto (2016), clinical symptoms experienced by hypertension sufferers usually include: dizziness, irritability, ringing in the ears, difficulty sleeping, shortness of breath, a feeling of heaviness in the nape of the neck, fatigue, dizziness in the eyes, and nosebleeds (rarely reported). Clinical symptoms experienced by hypertension sufferers usually include: dizziness, irritability, ringing in the ears, difficulty sleeping, shortness of breath, a feeling of heaviness in the nape of the neck, fatigue, dizziness in the eyes, and nosebleeds (rarely reported). The most frequent complications in hypertension are target organ diseases that occur in the heart (hypertensive heart disease), brain (cerebrovascular disease), peripheral vessels (peripheral vascular disease), kidneys (nephrosclerosis) and eyes (retinal damage) and hypertension is the main cause of cerebrovascular coronary heart disease and kidney failure. If high blood pressure is not treated and managed, in the long term it will cause damage to the arteries in the body to the organs that receive blood supply from these arteries (5).

In general, the prevalence of hypertension mostly occurs in the elderly group, but it turns out that the prevalence of hypertension in the productive age group tends to increase from year to year. People of productive age are susceptible to hypertension due to busyness and a lifestyle that pays little attention to health (6). According to WHO, productive age is in the age range of 20-59 years. Based on BKKBN data (2020), the results of a population survey showed that Indonesia's population is dominated by those of productive age (15-64 years) with a total of 191.08 million people or (70.2%). The risk of developing hypertension can also be caused by several factors such as smoking, alcohol consumption, and rarely doing physical activity due to busy daily activities.

Several studies state that there are several factors that cause hypertension from adolescence, adulthood, to old age. The factors themselves include factors that cannot be changed and factors that can be changed (7). One factor that can influence hypertension is nutritional status. Nutritional status can affect blood pressure, this happens because a large body mass requires more blood to provide oxygen and food to body tissues so that more blood flows in the blood vessels and causes the arterial walls to experience greater pressure (8). Hypertension is more at risk in people with over nutritional status or obesity five times higher than someone who has normal nutritional status because if body weight increases above ideal body weight then the risk of hypertension also increases (9). At the productive age, the impact of someone who has more nutritional status is that they tend to have high blood pressure than those who have less and normal nutritional status, and more nutrition increases the risk of hypertension for several reasons, the greater the body mass, the more blood is needed to function. supplies oxygen and food to the body's tissues and this means that the volume of blood circulating through the blood vessels increases, thus putting greater pressure on the artery walls, which will cause an increase in blood pressure. Apart from that, being overweight also increases the heart rate (10).

Meanwhile, hypertension that occurs in someone whose nutritional status is thin or normal can also be caused by the sympathetic system and the renin-angiotensin system. The activity of the sympathetic nerves is to regulate nerve and hormone function, so that it can increase heart rate, constrict blood vessels, and increase water retention and salt. In the renin-angiotensin system, renin triggers the production of aldosterone which will influence the kidneys to retain water and sodium, while angiotensin will reduce the diameter of blood vessels so that blood pressure will rise (11). Based on an initial survey conducted at the Simpang IV Sipin Community Health Center, Jambi City on December 31 2022 using the interview method, it was found that 6 out of 10 patients were aged 30-55 years, and 3 other patients aged 29-50 years and 1 patient aged 27 years, and 4 of the 10 patients had normal nutritional status, while the other 6 patients had overweight (obese). Based on the results of the initial survey, it indicates that patients are not yet aware that a person's nutritional status can influence the occurrence of hypertension and are still not good at maintaining their health.

This study aims to determine the factors associated with the incidence of hypertension in productive age

at the Simpang IV Sipin Health Center in Jambi City.

2. Methods

This research is a quantitative study using a cross sectional approach which aims to determine the relationship between the independent variables (age, gender, genetic history, diet, nutritional status and physical activity) and the dependent variable (the incidence of hypertension in productive age) at the same time. This research was carried out at Simpang IV Sipin Health Center in January-June 2023. The population in this study were all hypertensive patients in the productive age category (26-59 years) who were at the Simpang IV Sipin Community Health Center, Jambi City in January-March 2023 with a total of 96 people. Then the number of samples obtained through the Slovin formula calculation was 53 respondents. The sampling technique used in this research is incidental random sampling, which is a method of determining samples by taking respondents who happen to be present or available in a place according to the research context/inclusion criteria (11).

Primary data in this study was obtained from the results of the food frequency questionnaire (FFQ) assessment and the international physical activity questionnaire (IPAQ) which contained several questions given to patients at the Simpang IV Sipin Health Center, Jambi City. Secondary data is supporting data, namely consisting of data on the number of patients who have hypertension. Data was obtained from the Profile of the Jambi Province Health Service in 2020, the Jambi City Health Service in 2021 and the Simpang IV Sipin Health Center, Jambi City in 2023. Data processing is done by using a computerized program SPSS. The statistical test used is the Chi-Square test with a significance level of $\alpha=0,05$.

3. Results

The characteristics of the respondents in this study were hypertensive patients in the productive age category who visited the Simpang IV Sipin Health Center and who had their weight and height measured. The productive age in this study was 26-59 years, and nutritional status was divided into normal and malnutrition nutritional status categories (table 1).

Table 1 Characteristics of Productive Age

Characteristics	n	%
Productive Age (Years)		
26-35 years	15	28,3
36-45 years	11	20,8
46-59 years	27	50,9
Nutritional Status		
Normal	30	56,6
Malnutrition	23	43,4

Based on table 1, it is known that of the 53 respondents suffering from hypertension in the productive age group at Simpang IV Sipin Health Center, most of them were in the early elderly category (46-59 years), amounting to 27 respondents (50.9%), and it is known that of the 53 respondents suffering from hypertension in the productive age of Simpang IV Sipin Health Center, Jambi City, more than half have normal nutritional status, namely 30 respondents (56.5%).

Table 2. Relationship Between Nutritional Status and The Incidence of Hypertension in Productive Age

Nutritional Status	Hypertension Occurrence										Total	p-value	
	Isolated systolic hypertension		Isolated diastolic hypertension		Hypertension stadium 1		Hypertension stadium 2		Hypertension stadium 3				
	n	%	n	%	n	%	n	%	n	%			
Normal	3	5,7	7	13,2	11	20,8	7	13,2	2	3,8	30	55,6	0,022
Malnutrition	9	17,0	1	1,9	3	5,7	8	15,1	2	3,8	23	43,4	
Total	12	22,6	8	15,1	14	26,4	15	28,3	4	7,5	53	100	

Based on table 2, it is known that of the 53 hypertension sufferers, 30 sufferers had normal nutritional status (55.6%) and most were in the stage 1 hypertension category, namely 11 sufferers (20.8%) and 23 sufferers had malnutrition nutritional status (overnutrition, obesity) and most were in the isolated systolic hypertension category, namely 9 sufferers (17.0%). Based on statistical tests using the chi square test, the p-value was $0.022 < 0.05$. This shows that there is a significant relationship between nutritional status and the incidence of hypertension in productive age.

4. Discussion

The results of this study are in line with research conducted by Rizki, et al (2022), namely that fewer respondents were diagnosed with hypertension in the young age group than in the high age group, in the age group 14-24 years (8.29%), 25-34 years (11.52%), 35-44 years (17.92%), 45-54 years (29.16%) and 55-64 years (35.56%). Furthermore, the results of this study also agree with research conducted by Widjaya, et al (2018) which obtained results namely that there were more hypertension sufferers aged > 40 years as many as 41 respondents (93.1%). The results of this study are not in line with the results of research conducted by Elvira and Anggraini (2019), which showed that out of 100 respondents, there were less than half of hypertension sufferers aged <40 years with a total of 46 respondents (46%). Then the results of this research also do not agree with research conducted by Aristotle (2018) which found that there were more young people (20-45 years) with 35 respondents compared to the old age category (45-55 years) with 17 respondents.

Based on the research results, it is known that the majority of hypertension sufferers who come to the Simpang IV Sipin Health Center are sufferers in the 46-59 year age category and are included in the active working age category because age is a factor that cannot be changed so that the older you get, the higher the chance of being affected. hypertension. The age factor influences hypertension because as a person ages it can cause metabolic regulation to be disturbed which makes the risk of hypertension higher (12). Someone over 35 years old will experience a condition where the blood vessel walls will lose elasticity, systolic blood pressure will increase progressively according to age (13). Based on the research results and existing theories, the researchers are of the opinion that the number of hypertensives in the productive age group is greater in the 46-59 year range because some respondents are adults and have experienced hypertension since the age of 30 years and above because usually the function of the human body's organs as they get older, their function decreases. will become weak and susceptible to disease. Meanwhile, only a small number of young respondents suffer from hypertension, but those in productive age can also suffer from hypertension due to poor eating patterns such as frequently consuming foods high in fat, fast food, genetic factors, obesity, stress and unhealthy lifestyles. health problems such as smoking, lack of physical activity can also be a cause of hypertension in productive age.

The results of this research are in line with research conducted by Kisno et al (2021) which obtained results namely that out of 75 respondents, 8 respondents had underweighted nutritional status, 37 respondents had normal nutritional status, 15 respondents had overweight nutritional status, and 15 respondents had obese nutritional status. More nutritional status increases the risk of hypertension for several reasons, the greater the body mass, the more blood is needed to supply oxygen and food to the body's tissues and this means that the volume of blood circulating through the blood vessels increases, thus putting greater pressure on the walls. arteries, which will cause an increase in blood pressure, apart from that being overweight also increases the heart rate, while hypertension that occurs in someone whose nutritional status is thin or normal can also be caused by the sympathetic system and the renin-angiotensin system, the activity of the sympathetic nerves is regulates nerve and hormone function, so it can increase heart rate, constrict blood vessels, and increase water and salt retention. In the renin-angiotensin system, renin triggers the production of aldosterone which will influence the kidneys to retain water and sodium, while angiotensin will reduce the diameter of blood vessels so that blood pressure will rise (14).

Judging from the results above, hypertension can not only occur in someone who has excessive/abnormal nutritional status, but hypertension can also occur in someone who has normal nutritional status which can also be caused by the influence of genetic/hereditary history, besides that it can also be caused by function. nerves and hormones that increase heart rate and constrict blood vessels, so this is what causes hypertension even though you have normal nutritional status. Meanwhile, someone who has more nutritional status or is obese is more at risk of developing hypertension because if their body weight increases, their body also needs more blood to provide oxygen, which causes the arterial walls to experience greater pressure (15).

The results of this research are in line with research conducted by Langingi (2021) which obtained results using the chi square test, namely p-value $0.003 < 0.05$, which means H_0 is rejected and H_a is accepted so that the conclusion is that there is a relationship between nutritional status and the degree of hypertension in the elderly in the village. Kunciango, Lolak District. The results of this study are also in line with the results of research conducted by Agustina et al (2022) who obtained results through the Spearman rank test, namely p-value 0.001, which means H_a is accepted and shows that there is a relationship between nutritional status and the incidence of hypertension.

However, the results of this study are not in line with research conducted by Darmawan, et al (2018), namely based on the results of statistical tests obtained p-value = 0.062 which is greater than the alpha value (0.05) which means there is no relationship between nutritional status. with the incidence of hypertension. Based on the data obtained, it is known that there is a relationship between nutritional status and the incidence of hypertension in productive age because someone who has normal nutritional status can suffer from hypertension caused by several things such as having a poor diet, rarely exercising, not paying attention to health and having a hereditary history. from parents or other relatives. Meanwhile, 23 patients who had abnormal nutritional status (overnutrition and obesity) had a five times higher risk of developing hypertension because the greater the body mass, the more oxygen the blood needs, so the heart will continue to pump and result in an increase in blood pressure (16).

The relative risk of suffering from hypertension in someone who has abnormal nutrition is 5 times higher compared to people who have normal nutritional status. In addition, body mass index (BMI) is directly correlated with blood pressure, especially systolic blood pressure because the greater the body mass, the more blood is needed to supply oxygen and food to body tissues, this means that the volume of blood circulating through the blood vessels increases, thereby placing greater pressure on the walls of the arteries (17).

Therefore, researchers provide recommendations to the Simpang IV Sipin Health Center, Jambi City, to provide health education to hypertension sufferers with the theme "Ideal body weight as the first step in preventing and treating hypertension". The material presented can be in the form of how to maintain ideal body weight by managing the consumption of balanced nutrition, stopping smoking for men, increasing consumption of vegetables and fruit, and treatment for sufferers who have excess nutritional status or are obese to be able to change their lifestyle, engage in physical activity/ exercise at least 30 minutes/day and reduce habits that can increase the risk of hypertension.

5. Conclusion

Based on the results of data analysis, it can be concluded that the description of the frequency of hypertension sufferers in productive age at Simpang IV Sipin Community Health Center, Jambi City based on nutritional status, it is known that more than half have normal nutritional status (56.6%). Then, there was a relationship between nutritional status and the incidence of hypertension in productive age at Simpang IV Sipin Community Health Center, Jambi City with a p-value of 0.022.

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References

1. Ridwan, M. Mengenal, Mencegah, Mengatasi Silent Killer, "HIPERTENSI". Jakarta: Romawi Pustaka: 2017.
2. P2PTM Kemenkes RI. Hari Hipertensi Dunia 2019 : "Know Your Number Kendalikan Tekanan Darahmu dengan CERDIK. 2019.
3. Kementerian Kesehatan RI. Hasil Riset Kesehatan Dasar (Riskesdas) 2018. Jakarta. Badan Penelitian dan Pengembangan Kesehatan Kementerian RI. 2018.
4. Dinkes Provinsi Jambi. Profil Kesehatan Provinsi Jambi 2020.

5. Dinkes Kota Jambi. Laporan Kasus Penyakit Tidak Menular Di Kota Jambi Per Bulan Tahun 2020-2021.
6. Abata, Q. A. Ilmu Penyakit Dalam. Madiun: Yayasan PP Al-Furqon. 2016.
7. BKKBN. Hasil SP2020 Penduduk Indonesia. Jakarta.2020.
8. Triyanto, E. Pelayanan Keperawatan bagi Penderita Hipertensi Secara Terpadu. Yogyakarta: Graha Ilmu.2016.
9. Rasdianah. Mengenal Hipertensi Pada Kelompok Dewasa dengan Pendekatan Asuhan Keperawatan. Pekalongan: PT. Nasya Expanding Management. 2022.
10. Suhadi, R., Phebe, H., Yosef, W., Dita, M. V., Setiawan, C. H. Seluk Beluk Hipertensi: Peningkatan Kompetensi Klinis untuk Pelayanan Kefarmasian. Yogyakarta: Sanata Dharma University Press. 2016.
11. Sugiyono. Metode Penelitian Pendidikan (Pendekatan Kuantitatif, Kualitatif, dan R & D) Bandung: Alfabeta. 2016.
12. Trisnawan, A. Mengenal Hipertensi. Semarang: Mutiara Aksa. 2019.
13. Budi, S. P., Muhammad, A., Agus, S., Budi, B. D., I, G. R. S., & Johanes, N. E. *Hipertensi Manajemen Komprehensif*. Surabaya: Airlangga University Press (AUP). 2019.
14. Suhadi, R., Phebe, H., Yosef, W., Dita, M. V., Setiawan, C. H. Seluk Beluk Hipertensi: Peningkatan Kompetensi Klinis untuk Pelayanan Kefarmasian. Yogyakarta: Sanata Dharma University Press. 2016.
15. Hendra, P., Dita, M., Virginia, C., & Heru, S. Teori dan Kasus Manajemen Terapi Hipertensi. Yogyakarta: Sanata Dharma University Press. 2021
16. Fauzia, W. Edukasi Manajemen Diri Hipertensi. Bandung: Media Sains Indonesia. 2022.
17. Langingi, A. R. C. Hubungan Status Gizi Dengan Derajat Hipertensi Pada Lansia Di Desa Tombolango Kecamatan Lolak. *Community of Publishing In Nursing (COPING)*. 9(1). 46-57. 2021.
18. Rizki, D. F., Tisha, L., Fahmi, I., & Eka, F. Faktor Risiko Hipertensi Pada Usia Produktif Di Indonesia Dan Upaya Penanggulangannya. Pusat Riset Kesehatan Masyarakat dan Gizi, Badan Riset dan Inovasi Nasional. 25(1). 32-41. 2022.
19. Widjaya, N., Faisal, A., Ratih, L., Sabrina., Ranty, R. P., & Erlina, W. Hubungan Usia dengan Kejadian Hipertensi di Kecamatan Kresek dan Tegal Angus, Kabupaten Tangerang. *Jurnal Kedokteran Yarsi*. 26(3). 131-138. 2018.
20. Elvira, M., & Anggraini, N. Faktor-Faktor Yang Berhubungann Dengan Kejadian Hipertensi. *Jurnal Akademika Baiturrahim*. 8(1). 78-89. 2019.
21. Aristoteles. Korelasi Umur Dan Jenis Kelamin Dengan Penyakit Hipertensi Di Emergency Center Unit Rumah Sakit Islam Siti Khadijah Palembang 2017. *Indonesia Jurnal Perawat*. 3(1). 9-16. 2018.
22. Kisno, R. S., Akhma., & Ria, I. K. P. Hubungan Status Gizi dan Aktivitas Fisik Dengan Kejadian Hipertensi Remaja. *Jurnal Gizi*. 10(2). 10-19. 2021.
23. Paruntu, L. O., Fred A. R., & Griche, K. Hubungan Aktivitas Fisik, Status Gizi, dan Hipertensi Pada Pegawai di Wilayah Kecamatan Tomohon Utara. *Jurnal Gizi Poltekkes Manado*. 7(1). 1-6. 2018.
24. Agustina., Nurika, N., Antok., Nurwidi. A., & Siti, U. C. Hubungan Status Gizi Dengan Kejadian Hipertensi Pada Lanjut Usia Di Desa Girisekar Wilayah Kerja Puskesmas Panggang II Kabupaten Gunungkidul. *Jurnal Kesehatan Samodra Ilmu*. 13(1). 7-10. 2022.