Healthy Tadulako Journal (Jurnal Kesehatan Tadulako)
Vol. 11 No. 1, January 2025
P-ISSN : 2407-8441/e-ISSN : 2502-0749

Original Research Paper

Analysis of Dietary Patterns on the Incidence of Hypertension Among the Elderly

Nofi Susanti*, Nurkholisah br Ginting, Annisa Nur Ardiani, Wahyu Annisyah

Public Health Study Program, Faculty of Public Health, Universitas Islam Negeri Sumatera Utara, Medan, Indonesia

Email Corresponding:
nofisusanti@uinsu.ac.id

Page : 15-22

Keywords:
Nutrition, Hypertension, Dietary habits

Article History:
Received: 2024-07-07
Revised: 2024-07-18
Accepted: 2024-11-27

Published by:
Tadulako University,
Managed by Faculty of Medicine.
Email: healthytadulako@gmail.com
Phone (WA): +6285242303103
Address:
Jalan Soekarno Hatta Km. 9. City of Palu, Central Sulawesi, Indonesia

ABSTRACT

Background: Hypertension is a major global public health issue, defined as a systolic pressure ≥140 mmHg and/or diastolic >90 mmHg. If uncontrolled, it can lead to serious complications such as stroke, heart disease, and kidney failure. However, it is largely preventable through healthy lifestyle changes, particularly diet. **Objective:** This study aims to examine the relationship between dietary habits and the incidence of hypertension, highlighting the role of a healthy lifestyle as a preventive measure. **Methods:** A quantitative study with a cross-sectional design was conducted involving 35 respondents from the Golf Course Road Neighborhood, Tuntungan Village, Pancur Batu Sub-District, Deli Serdang Regency, North Sumatra. Data were collected through interviews and surveys. The Chi-square test was used to assess the association between diet and hypertension. **Results:** The analysis revealed a significant relationship between dietary habits and hypertension incidence, with a Chi-square value of 6.2, which exceeds the critical value of 3.841 (X^2 count 6.2 > X^2 table 3.841). **Conclusion:** There is a significant association between unhealthy dietary habits and the incidence of hypertension. Promoting balanced and nutritious diets is crucial for hypertension prevention and should be a focus of community health education initiatives.

Introduction

Hypertension is a non-communicable disease commonly found in the community and contributes to a high morbidity rate[1]. Today, hypertension has become a global issue due to its increasing prevalence every year. This disease can trigger various other chronic conditions, thus requiring prompt management to prevent complications and other negative impacts[2]. Hypertension is not only associated with heart disease and stroke, but it can also lead to kidney disorders, eye damage, and various other serious complications[3].

Hypertension is a condition where blood pressure persistently remains at or above 140 mmHg systolic and above 90 mmHg diastolic. Normal blood pressure is typically around 120/80 mmHg[4]. Hypertension, also known as high blood pressure, is a vascular disorder that contributes significantly to the high mortality rate worldwide[5]. According to the Riskesdas data (Ministry of Health of the Republic of Indonesia, 2021), the prevalence of hypertension in Indonesia has reached 34.1%, an increase from 25.8% in 2013[6]. This data indicates a worrying trend, considering the broad impact of hypertension on public health.

Hypertension risk factors are divided into two categories: modifiable and non-modifiable factors. Modifiable factors include smoking, obesity, a sedentary lifestyle, and stress. On the other hand, non-modifiable factors include age, gender, ethnicity, and genetic predisposition. Efforts to prevent and control hypertension should focus on modifiable factors through various health interventions[7].

One of the key efforts in preventing hypertension is through dietary regulation. A

healthy diet involves managing the quantity, type, and timing of meals appropriately to maintain health. This includes balanced consumption habits of fat, sodium, and potassium. A low-sodium diet and obesity control are primary strategies in the prevention of hypertension. In addition, other healthy behaviors such as regularly monitoring blood pressure, avoiding smoking, increasing physical activity, and following a balanced diet that is high in fiber, low in fat, and low in salt are highly recommended[8].

Hypertension prevention and control efforts are a combination of individual or community actions supported by existing healthcare service programs. It is important to initiate these efforts as early as possible to reduce the risk of long-term complications[9]. For patients with hypertension, routine care is necessary to regularly monitor their blood pressure.

As age increases, the incidence of hypertension also rises. This is due to natural changes in the heart, blood vessels, and hormone levels. As a result, hypertension becomes a common health issue among the elderly[10]. The elderly are a group vulnerable to hypertension because of the physiological changes they experience with aging[11].

Research has shown that diets high in salt and saturated fats can increase the risk of hypertension among the elderly. A study by Nikiforov et al. (2021) found that high sodium intake is significantly associated with elevated blood pressure in older adults[12]. In addition, research by Ahmed et al. (2021) revealed that a diet high in saturated fats not only raises blood pressure but also contributes to the development of insulin resistance, which is an additional risk factor for cardiovascular disease in the elderly population[13].

Dietary interventions focused on reducing salt and saturated fat intake have been proven effective in lowering blood pressure. A study by Ojangba et al. (2023) demonstrated that elderly individuals who followed a low-sodium diet experienced significant reductions in both systolic and diastolic blood pressure. This study highlights the importance of dietary modifications as a key strategy in the management of hypertension in older adults[14].

Furthermore, a study by Jorquera et al. (2023) demonstrated that high consumption of vegetables and fruits, which are rich in potassium, can help lower blood pressure in older individuals. Potassium helps balance the effects of sodium and supports healthy blood vessel function. This study supports the recommendation to increase the intake of potassium-rich foods as part of dietary strategies to prevent and manage hypertension[15].

In addition to diet, an active lifestyle also plays an essential role in hypertension control. According to a study by Makawekes et al. (2020), elderly individuals who regularly participate in physical activity have lower blood pressure compared to those who lead a less active lifestyle. Physical activity helps maintain heart and vascular health and contributes to weight control, which is a major risk factor for hypertension[16].

It is also important to consider the role of social support in hypertension management. A study by Laia et al. (2023) indicated that strong social support from family and friends can help elderly individuals manage their blood pressure. Social support can motivate individuals to adhere to dietary and physical activity recommendations, and also provide the emotional support needed to cope with stress, another risk factor for hypertension[17].

In addition to dietary and lifestyle interventions, stress management also plays a critical role in hypertension control. Research by Goldstein et al. (2024) found that relaxation techniques such as meditation and yoga can help lower blood pressure in individuals with hypertension. These techniques help reduce cortisol levels, a stress hormone that can raise

blood pressure if left uncontrolled[18].

This study aims to examine the relationship between dietary patterns and the incidence of hypertension among the elderly in the area of Jalan Lapangan Golf Neighborhood, Tuntungan Village, Pancur Batu Subdistrict, Deli Serdang Regency, North Sumatra. Although numerous studies have investigated hypertension in the general population, this research stands out by focusing specifically on elderly individuals in a particular community, using a quantitative approach and purposive sampling technique. Statistical analysis revealed a significant relationship between dietary patterns and the occurrence of hypertension, highlighting the importance of dietary interventions in managing hypertension among the elderly. These findings are expected to serve as a foundation for more effective prevention strategies and health policies that support the improvement of the quality of life for the elderly in this community.

Materials and Methods

Study Design

This study employed a descriptive quantitative design with a cross-sectional approach. This design was chosen to describe the relationship between dietary patterns and the incidence of hypertension among elderly individuals residing in the Golf Course Road Neighborhood, Tuntungan Village, Pancur Batu Sub-District, Deli Serdang Regency, North Sumatra, at a single point in time.

Sample

The study population consisted of all elderly individuals living in the Golf Course Road Neighborhood, Tuntungan Village. The sample was selected using purposive sampling based on specific inclusion criteria: elderly individuals who were willing to participate, able to communicate effectively, and did not have chronic illnesses other than hypertension. A total of 56 elderly individuals were selected as study participants.

Data Collection Techniques

Data were collected through interviews and surveys using a structured questionnaire composed of two main sections: demographic data and dietary patterns. The demographic section included variables such as age, gender, educational background, and employment status. The dietary pattern section included questions on the frequency and types of food consumed on a daily basis. Blood pressure was measured using a calibrated digital sphygmomanometer to ensure accuracy.

Data Analysis

The collected data were analyzed using both descriptive and inferential statistics. Descriptive statistics were used to present the demographic characteristics and dietary patterns of the respondents. Inferential analysis was performed using the Chi-square test to examine the association between dietary habits and the incidence of hypertension among the elderly participants.

Ethical Considerations

Although this study did not obtain formal ethical clearance from a research ethics committee, all ethical principles related to research involving human subjects were carefully observed. Prior to data collection, informed consent was obtained from all participants after explaining the purpose and procedures of the study. Participation was entirely voluntary, and respondents were assured of the confidentiality and anonymity of their personal information. The rights and well-being of the participants were respected throughout the research process.

Result

The results of the study (Table 1) show that the majority of respondents were aged between 45–60 years, totaling 24 individuals (68.5%), while

those aged 61–81 years were fewer, with 11 individuals (31.4%). Females dominated the sample with 19 individuals (54.2%), while male respondents totaled 16 individuals (45.7%). Most of the respondents were employed, amounting to 25 individuals (71.4%), while the unemployed group consisted of 10 individuals (28.5%).

Table 1. Respondent Characteristics

Variable	Frequency	Percentage
Gender		
Male	16	45.7%
Female	19	54.2%
Age Group		
45–60 years	24	68.5%
61–81 years	11	31.4%
Employment Status		
Employed	25	71.4%
Unemployed	10	28.5%
Hypertension Status		
Hypertensive	20	57.1%
Non-hypertensive	15	42.8%
Dietary Pattern		
Good	16	45.7%
Poor	19	54.2%

Table 1 also shows that out of the total 35 respondents, 20 individuals (57.1%) were diagnosed with hypertension, while 15 individuals (42.8%) did not have the condition. In terms of dietary patterns, 19 individuals (54.2%) had poor dietary habits, while 16 individuals (45.7%) had good dietary habits.

Table 2. The Relationship Between Dietary Patterns and Hypertension Incidence

Dietary Pattern	Hypertensive		Non-hypertensive		Total		X^2
	n	%	n	%	n	%	
Good	5	31.2%	11	68.7%	16	100%	6.2
Poor	15	78.9%	4	21.1%	19	100%	
Total	20	57.1%	15	42.9%	35	100%	

Based on Table 2, among the 19 respondents with poor dietary habits, 15 respondents or 78.9% had hypertension, while 4 respondents or 21% did not suffer from hypertension. On the other hand, among respondents with good dietary habits, 5 respondents or 31.2% had hypertension, and 11 respondents or 68.7% did not have hypertension.

With a calculated Chi-Square (X^2) value of 6.2 and a Chi-Square table value of 3.841, it can be concluded that the calculated X^2 is greater than the table value. Therefore, the null hypothesis (Ho) is rejected, indicating a significant relationship between poor dietary habits and the incidence of hypertension among the elderly. In this context, the results of the Chi-Square test suggest that poor dietary habits are potentially associated with an increased risk of hypertension in the studied elderly population.

Discussion

Dietary Patterns

The data show that respondents with poor dietary habits had a higher prevalence of hypertension (78.9%) compared to those with good dietary habits (31.2%). This is consistent with the literature, which indicates that high intake of salt and saturated fats can increase the risk of hypertension. A study by Grillo et al. (2019) found that excessive salt consumption can lead to fluid retention, which raises blood pressure. Additionally, high intake of saturated fats can cause plaque buildup in the arteries, further increasing the risk of hypertension[19].

A study by Ojangba et al. (2023) supports these findings by showing that a low-sodium diet is effective in lowering blood pressure in individuals with hypertension[14]. Furthermore, adequate potassium intake through fruits and vegetables can help balance the effects of sodium in the body and support vascular health, as demonstrated by research conducted by Stone et al. (2023)[20].

In the context of the elderly, the importance of a balanced diet is further reinforced by a study by Altawili et al. (2023), which highlights that a diet rich in fiber, low in saturated fats, and high in potassium is highly effective in reducing the risk of hypertension[21]. Additionally, the Mediterranean diet—rich in

fruits, vegetables, fish, and olive oil has also been found effective in reducing blood pressure and the risk of cardiovascular disease[22].

Lifestyle and Physical Activity

An active lifestyle can play a significant role in managing hypertension. Based on the collected data, 71.4% of the respondents who were employed may have had higher levels of physical activity compared to the 28.5% who were unemployed. Adequate physical activity is known to help control body weight and reduce blood pressure. A study by Makawekes et al. (2020) found that elderly individuals who engaged in regular physical activity had lower blood pressure compared to those with a sedentary lifestyle[16]. Physical activity improves heart and vascular function and aids in stress management, which also contributes to blood pressure control.

A study by Dhuli et al. (2022) showed that physical activities such as walking, cycling, and strength training can help lower blood pressure and enhance overall cardiovascular health[23]. In addition, regular exercise can increase insulin sensitivity and assist in weight management, both of which are important factors in hypertension control.

Social Support and Hypertension Management

Social support from family and the community can play a crucial role in the management of hypertension. Emotional and social support can help individuals adhere to medical and dietary recommendations, as well as reduce stress levels that may affect blood pressure. A study by Shen et al. (2022) indicated that individuals with strong social support have better capabilities in managing hypertension and maintaining overall health[24]. Social support can also provide the moral and psychological encouragement needed to sustain a healthy lifestyle.

Research by Fajari et al. (2021) confirmed that social support can reduce the effects of stress and enhance emotional well-being, which in turn contributes to better blood pressure control[25]. Additionally, community intervention programs involving health education and group support have also been proven effective in reducing the prevalence of hypertension[26].

The Influence of Age and Gender

The influence of age and gender should also be considered in this discussion. Menopause in women can affect the risk of hypertension due to the decrease in estrogen levels, which can lead to changes in the cardiovascular system. A reduction in vascular elasticity and increased vascular resistance are some of the physiological changes that occur in the elderly, potentially increasing the risk of hypertension[27]. According to research by Lestari et al. (2020), postmenopausal women have a higher risk of hypertension compared to premenopausal women[28].

In older age groups, the prevalence of hypertension tends to be higher. This may be due to the accumulation of risk factors over a lifetime such as unhealthy dietary habits, lack of physical activity, and stress[29]. A study by Yunus et al. (2021) revealed that physiological changes associated with aging, including declining kidney function and hormonal changes, also contribute to the increased risk of hypertension in the elderly[30].

Effective Dietary Interventions

One of the dietary interventions proven to be effective in lowering blood pressure is the DASH diet (Dietary Approaches to Stop Hypertension). This diet encourages high consumption of fruits, vegetables, low-fat dairy products, and whole grains, while reducing intake of salt, saturated fats, and cholesterol. Research has shown that the DASH diet can significantly lower both systolic and diastolic blood pressure, as well as reduce the risk of hypertension. A study by Utami (2021) demonstrated that the DASH diet, combined

with reduced salt intake, can significantly lower blood pressure in individuals with hypertension[31].

Furthermore, adequate potassium intake through this diet can help balance the effects of sodium in the body and support vascular health. A study by Kim et al. (2024) showed that increased potassium intake can help lower blood pressure, especially in individuals with high salt intake[32].

The Mediterranean diet, which is rich in fruits, vegetables, fish, and olive oil, has also been found effective in reducing blood pressure and the risk of cardiovascular disease. The Mediterranean diet can reduce the risk of major cardiovascular events, including hypertension, by 30%[22].

Conclusion

Based on the results of the study conducted in the area of Jalan Lapangan Golf, Desa Tuntungan, Kec. Pancur Batu, Kab. Deli Serdang, North Sumatra, it can be concluded that most respondents who suffered from hypertension had poor dietary patterns. The results of the study using the Chi-Square (X^2) method indicated a significant relationship between dietary patterns and the incidence of hypertension among the elderly, with a Chi-Square value of 6.2. These findings suggest that respondents with poor dietary habits had a higher prevalence of hypertension compared to those with healthy eating habits. Diets high in salt and saturated fats, and low in fruits and vegetables, were significantly associated with an increased risk of hypertension. Additionally, an active lifestyle and strong social support were also found to play a role in managing blood pressure.

The researcher recommends that the community, especially the elderly, regularly check their blood pressure at healthcare services and maintain a healthier diet. It is also advised to engage in regular physical activity, as it can help reduce the risk of developing hypertension.

Acknowledgements

We extend our deepest gratitude to all parties who contributed to this research. Special thanks to the respondents in the Golf Course Road Neighborhood, Tuntungan Village, Pancur Batu Sub-District, Deli Serdang Regency, North Sumatra, who generously gave their time and provided valuable information. We also express our appreciation to the research team and healthcare workers who assisted in the data collection and analysis process. The support from the local community and various related stakeholders greatly facilitated the smooth conduct of this study. We hope that the results of this research will be beneficial and make a positive contribution to improving public health, particularly in the prevention and management of hypertension among the elderly.

References

1. Simamora HG, Simbolon N, Sianturi E. Hubungan Pola Makan Dengan Hipertensi Pada Lansia Di Kelurahan Mangga Dua Week Vii Simalingkar.*J Keperawatan Wiyata*. 2023;4(2).
2. Yasril AI, Rahmadani W. Hubungan Pola Makan Dengan Kejadian Hipertensi Di Wilayah Kerja Puskesmas Kebun Sikolos Kota Padang Panjang Tahun 2019. *J Sehat Mandiri*. 2020;15(2):33-43.
3. Saifah A, Nur AF. Kemampuan Keluarga Merawat Klien Insomnia Dan Hipertensi. *Healthy Tadulako Journal (Jurnal Kesehatan Tadulako)*. 2020;6(3):14-21.
4. Palesa H, Sridani NW. Faktor – Faktor Yang Berhubungan Dengan Penderita Hipertensi Di Rsu Anutapura Palu Provinsi Sulawesi Tengah. *Healthy Tadulako Journal (Jurnal Kesehatan Tadulako)*. 2019;5(2):63-71.
5. Rizkawati M, Fairus RA, Absari NW. Potensi Tanaman Herbal Bunga Telang (Clitoria Ternatea) Sebagai Alternatif

Antihipertensi. *Healthy Tadulako Journal (Jurnal Kesehatan Tadulako)*. 2023;9(1):43-50.

6. Maulidah K, Neni N, Maywati S. Hubungan Pengetahuan, Sikap Dan Dukungan Keluarga Dengan Upaya Pengendalian Hipertensi Pada Lansia Di Wilayah Kerja Puskesmas Cikampek Kabupaten Karawang. *J Kesehat Komunitas Indones*. 2022;18(2):484-494.
7. Rahmadani M. Faktor-Faktor Yang Mempengaruhi Terjadinya Hipertensi Pada Masyarakat Di Kampung Bedagai Kota Pinang. *J Kedokt STM (Sains dan Teknol Med*. 2021;IV(I):52-62.
8. Lubis IAP, Siregar SR, Z. K. Diet Rendah Garam pada Pasien Hipertensi. *Galen J Kedokt dan Kesehat Mhs Malikussaleh*. 2024;3(1):68-76.
9. Carey RM, Muntner P, Bosworth HB, Whelton PK. Prevention and Control of Hypertension: JACC Health Promotion Series. *HHS Public Access*. 2018;72(11):1278-1293.
10. Kumalasari P, Sattu M, Tongko M, et al. Pola Hidup Penderita Hipertensi di Desa Duata Karya Kecamatan Masama Tahun 2021. *J Kesmas Untika Luwuk Public Heal J*. 2021;12(2):92-102.
11. Riamah. Faktor-Faktor Penyebab Terjadinya Hipertensi Pada Lansia Di Upt Pstw Khusnul Khotimah. *MENARA Ilmu*. 2019;XIII(5):106-113.
12. Nikiforov I, Shah C, Kanukuntla A, Mohan J, Vanjarapu R, Singh P. Salt Consumption and Myocardial Infarction : Is Limited Salt Intake Beneficial ? *Cureus*. 2021;13(2).
13. Ahmed B, Sultana R, Greene MW. Biomedicine & Pharmacotherapy Adipose tissue and insulin resistance in obese. *Biomed Pharmacother*. 2021;137(December 2020):111315.
14. Miao Y, Ojangba T, Boamah S, et al. Comprehensive effects of lifestyle reform , adherence , and related factors on hypertension control : A review. *Wiley*. 2023;(February):509-520.
15. Peña-jorquera H, Cid-jofr V, Landaeta-d L, Petermann-rocha F. Plant-Based Nutrition : Exploring Health Benefits for Atherosclerosis , Chronic Diseases , and Metabolic Syndrome — A Comprehensive Review. *Nutrients*. 2023;15(3244).
16. Makawekes E, Suling L, Kallo V. Pengaruh Aktivitas Fisik Terhadap Tekanan Darah Pada Usia Lanjut 60-74 Tahun.*J Keperawatan*. 2020;8(1):83-90.
17. Laia YI, Simangunsong RK, Sitepu MB, Santri H, Kaban KB. Pengaruh Dukungan Sosial Dengan Kualitas Hidup Lanjut Usia Pada Penderita Hipertensi.*J Penelit Perawat Prof*. 2024;6(3):1137-1144.
18. Goldstein CM, Josephson R, Xie S, Hughes JW. Current Perspectives on the Use of Meditation to Reduce Blood Pressure. *Int J Hypertens*. Published online 2012.
19. Grillo A, Salvi L, Coruzzi P, Salvi P, Parati G. Sodium Intake and Hypertension. *Nutrients*. 2019;11:1-16.
20. Stone MS, Martyn L, Weaver CM. Potassium Intake, Bioavailability, Hypertension, and Glucose Control. *Nutrients*. 2016;8(444):1-13. doi:10.3390/nu8070444
21. Altawili AA, Altawili M, Alwadai AM, et al. An Exploration of Dietary Strategies for Hypertension Management : A Narrative Review. *Cureus*. 2023;15(12). doi:10.7759/cureus.50130
22. Martínez-gonzález MA, Gea A, Ruiz-canela M. The Mediterranean Diet and Cardiovascular Health. *Circ Res*. Published online 2019:779-798. doi:10.1161/CIRCRESAHA.118.313348
23. Dhuli K, Naureen Z, Medori MC, et al. Physical activity for health. *J Prev Med Hyg*. 2022;63:150-159.
24. Shen Z, Ding S, Shi S. Association between social support and medication literacy in older adults with hypertension. *Front Public Heal*. Published online 2022.
25. Zapater-fajarí M, Crespo-sanmiguel I, Pulopulos MM, Hidalgo V, Salvador A.

Resilience and Psychobiological Response to Stress in Older People : The Mediating Role of Coping Strategies. *Front Aging Neurosci*. 2021;13:1-15.

26. Shin J, Diema K, Id K, Mensah E. Health promotion interventions for the control of hypertension in Africa , a systematic scoping review from 2011 to 2021. *PLoS One*. 2021;16(11).
27. Maringga EG, Sari NIY. Analisis Faktor yang Mempengaruhi Kejadian Hipertensi Pada Wanita Menopause di Desa Kayen Kidul Kecamatan Kayen Kidul Kabupaten Kediri. *Midwiferia J Kebidanan*. 2020;6(2):21-25.
28. Lestari AD, Putri RH, Yunitasari E. Hipertensi pada wanita menopause ; Sebuah tinjauan literatur. *Wellness Heal Mag*. 2020;2(2):309-313.
29. Meher M, Pradhan S, Pradhan SR. Risk Factors Associated With Hypertension in Young Adults : A Systematic Review. *Cureus*. 2023;15(4). doi:10.7759/cureus.37467
30. Yunus M, Aditya IWC, Eksa DR. Hubungan Usia Dan Jenis Kelamin Dengan Kejadian Hipertensi Di Puskesmas Haji Pemanggilan Kecamatan Anak Tuha Kab. Lampung Tengah. *J Ilmu Kedokt Dan Kesehat*. 2021;8(September):229-239.
31. Utami RP. Efektivitas Diet DASH (Dietary Approaches to Stop Hypertension) pada Pasien Hipertensi: Literatur Review. *J Gizi Kerja dan Produkt*. 2021;2(2):93-98.
32. Kim BS, Yu MY, Shin J. Effect of low sodium and high potassium diet on lowering blood pressure and cardiovascular events. *Clin Hypertens*. 2024;30(2):1-13.