PHYSICAL ACTIVITY AND DIETARY KNOWLEDGE AMONG ELDERLY WITH HYPERTENSION: A STUDY IN RANGKASBITUNG PHC

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Abstract

Hypertension is Hypertension is defined as systolic blood pressure >130 mmHg and/or diastolic blood pressure >80 mmHg. Many factors influence the development of hypertension, including genetic factors, age, and gender; physical activity and sodium intake (diet) may also be associated with the occurrence of hypertension. This study aims to determine the relationship between physical activity and dietary knowledge and the incidence of hypertension in the catchment area of the Rangkasbitung Community Health Centre. The study is analytical in nature, employing a cross-sectional research design, wherein the independent variables (physical activity and dietary knowledge) and the dependent variable (hypertension) are examined simultaneously. The study population comprised 33 elderly individuals from Kampung Cileuweung, selected using convenience sampling. Data were collected using a questionnaire. The data analysis used in this study was univariate and bivariate analysis. The results showed a significant association between physical activity (p=0.02) and dietary knowledge (p=0.017) and the incidence of hypertension in the service area of the Rangkasbitung Community Health Centre. Based on this study, it is hoped that respondents will be able to control their blood pressure by improving their lifestyle through dietary control and regular exercise.

Keywords: Physical activity, Dietary knowledge, Hypertension

1. INTRODUCTION

Hypertension or high blood pressure, is a significant global health problem, affecting more than one billion people worldwide[1]. According to data from the World Health Organization (WHO), it is estimated that by 2025, approximately 1.5 billion people will suffer from hypertension, and each year, 9.4 million deaths are caused by hypertension and its complications [1], [2]. In Indonesia, hypertension is also a serious health problem, with prevalence continuing to rise alongside increasing life expectancy and changes in people's lifestyles [3]. The prevalence of hypertension in Banten Province based on physician diagnosis was 9.5% with 27,784 weighted respondents, while based on blood pressure measurement results it was 26.8% with 25,982 weighted respondents [1]. In 2024, the number of hypertensive patients in Banten Province reached 2,352,657 people, with the majority being female, and 88.2% had received health services [2]. Hypertension is often referred to as the 'silent killer' because it frequently shows no clear symptoms until serious complications arise [3]. Complications of hypertension include heart disease, stroke, kidney failure, and damage to other organs [4].

Older adults are a group particularly vulnerable to hypertension. The natural ageing process causes physiological changes in the body, including a reduction in blood vessel elasticity and an increase in peripheral resistance, which contribute to elevated blood pressure [6]. Furthermore, other risk factors such as an unhealthy diet, lack of physical activity, obesity, and stress can also increase the risk of hypertension in older adults[5].

Diet plays a crucial role in blood pressure control. Excessive salt intake is one of the main factors contributing to hypertension, [6] It has been found that older adults with a high salt intake have a higher risk of developing severe hypertension. Furthermore, high intakes of saturated fat and cholesterol can

also increase blood pressure [7]. Conversely, consuming fibre-rich foods, such as fruit and vegetables, can help lower blood pressure,[9] and the Dietary Approaches to Stop Hypertension (DASH) diet is recommended as an effective diet for lowering blood pressure in hypertensive patients. Education on the DASH diet has been shown to effectively improve knowledge of the DASH diet among hypertensive patients [8].

Physical activity is also a key component in managing hypertension. A lack of physical activity can increase the risk of obesity, insulin resistance, and endothelial dysfunction, all of which contribute to elevated blood pressure [9]. Regular physical activity can help lower blood pressure, improve lipid profiles, and enhance insulin sensitivity [10]. Furthermore, physical activity can help reduce stress, which may also contribute to elevated blood pressure. Anti-stroke exercise has also been shown to lower blood pressure in older adults [11].

Knowledge regarding diet and physical activity is crucial for older adults with hypertension. Good knowledge can help older adults make healthy food choices and increase their participation in physical activity [12]. [13] found that there is a link between knowledge and older adults' behaviour in managing hypertension. Furthermore, social support from family and healthcare professionals can also improve older adults' adherence to diet and physical activity [14].

Data from the Lebak District Health Office in 2024, covering 43 Community Health Centres (Puskesmas) with a total of 959,038 patients with hypertension, showed that the total number of visits was only 179,050. At the Rangkasbitung Community Health Centre (PKM), there were 68,016 people with hypertension, whilst the number of hypertensive patients attending in 2024 was only 12,377. The low participation of hypertensive patients in seeking medical check-ups is an issue that must be addressed immediately, and this suggests that there may still be many elderly individuals who lack adequate knowledge regarding the appropriate diet and physical activity required to manage hypertension [12].

In relation to this, untreated hypertension can cause various complications affecting the cardiovascular, nervous, and renal systems. This condition can accelerate atherosclerosis, increase left ventricular workload, and lead to left ventricular hypertrophy, which increases the risk of coronary heart disease, arrhythmias, and heart failure [15]. Furthermore, these complications indicate that hypertension is a serious disease that not only increases mortality rates but also reduces patients' quality of life both physically and psychologically[16].

The promotive role of nurses is needed to address the rising incidence of hypertension by providing education on hypertension management, such as low-sodium diets and hypertension exercise through counseling methods [17].

In cases of hypertension, in addition to medical treatment, preventive efforts can be made through lifestyle modifications, including reducing salt intake, maintaining a healthy diet, exercising regularly, avoiding stress, quitting smoking, and limiting caffeine and alcohol consumption. In addition, complementary therapies such as boiled celery leaf decoction can be used because it contains hexane, methanol, and ethanol compounds that have antihypertensive effects and help lower blood pressure in hypertensive patients [18].

Nurses can perform curative efforts by routinely monitoring blood pressure, administering and supervising the use of antihypertensive and cardiac medications according to therapy, observing signs and symptoms of complications such as shortness of breath, chest pain, dizziness, or edema, and collaborating with physicians for further management. In addition, efforts to prevent sudden death can be made by strengthening case management and emergency response at various levels of health care involving health workers and related organizations [19].

Rehabilitative nursing interventions for hypertensive patients can be carried out through education on routine check-ups, light physical activity training, low-sodium dietary management, monitoring medication adherence, and supporting patients to perform self-care at home. Furthermore, non-pharmacological therapies such as warm foot baths and foot massage can also help lower blood pressure, improve blood circulation, and reduce complaints of dizziness and headache [20].

2. METHODOLOGY

This study employed a quantitative approach using a cross-sectional study design. The cross-sectional design was chosen as it allowed the researchers to collect data in which the independent

variables (physical activity and dietary knowledge) and the dependent variable (hypertension) among older adults were examined simultaneously. The study was conducted in Kampung Cileuweung, a village under the jurisdiction of the Rangkasbitung Community Health Centre. The study was carried out in November 2025. The population in this study comprised all elderly residents in Kampung Cileuweung, totalling 33 elderly individuals, using convenience sampling. Data analysis employed univariate and bivariate analysis. Once the data had been collected, it was analysed using SPSS 22. Bivariate analysis utilised the Chi-Square test.

3. RESULTS

This study was conducted in November 2025, within the working area of the Rangkasbitung Community Health Centre, with a sample size of 33. The data in the study included physical activity and dietary knowledge (independent variables) and the incidence of hypertension (dependent variable). The results of the data collection are presented as follows:

3.1 Univariate Analysis

3.1.1 Respondent Characteristics

Table 3.1 Frequency Distribution of Gender, Age, and Education

Characteristics	Frequency	Percentage (%)
Gender		
Male	8	24,2
Female	25	75,8
Total	**33**	**100,0**
Age		
>75 Years	**3**	9,1
71-75 Years	4	12,1
66-70 Years	4	12,1
60-65 Years	22	66,7
Total	**33**	**100,0**
Education		
Did not complete primary school	3	9,1
Primary school	25	75,8
Lower Secondary	1	3
Upper Secondary School/Vocational School	4	12,1
Total	**33**	**100**

According to Table 3.1, the majority of respondents were female, numbering 25 (75.8%); the majority were aged 60–65, numbering 22 (66.7%); and the majority had completed primary school, numbering 25 (75.8%).

3.1.2 Physical activity

Tabel 3.2 Frequency distribution of respondents based on physical activity, knowledge and blood pressure among older adults with hypertension.

Physical Activity	Frequency	Percentage (%)
Poor	21	63,7 %
Good	12	36,3 %
Total	**33**	**100 %**
Dietary Knowledge		
Poor	19	57,6 %
Good	14	42,4 %
Total	**33**	**100 %**
Blood Pressure		
Hypertension	23	69,7 %
Non-hypertension	10	30,3 %
Total	**33**	**100 %**

Table 3.2 shows the distribution of respondents according to physical activity; of the 33 respondents, 21 (63.7%) fell into the 'poor physical activity' category, regarding knowledge of the hypertension diet, out of 33 respondents, 19 (57.6%) fell into the 'poor knowledge' category; and regarding blood pressure, out of 33 respondents, 23 (69.7%) were found to have hypertension.

3.2 Bivariate Analysis

Bivariate analysis will be used to determine the relationship between the independent variables (physical activity and dietary knowledge) and the dependent variable (hypertension). The statistical test to be used is the Chi-Square test, as the variables under investigation are on a nominal and ordinal scale. The statistical test used is the Chi-Square test, whereby the Chi-Square test can only be used to determine whether or not there is a relationship between two variables; a decision is made that if the p value ≤ α (0.05), then there is a relationship between the two variables.

3.2.1 The relationship between physical activity and the incidence of hypertension

Tabel 3.3 Relationship Between Physical Activity and the Incidence of Hypertension in the Rangkasbitung Community Health Centre (PKM) Service Area

Physical activity	Incidence of Hypertension				TOTAL	%	P Value	OR (95% CI)
	Hypertension	%	Non Hypertension	%				
	N		N					
Tidak Baik	17	51,5	4	12,1	21	100	0,02	0,05
Baik	6	18,2	6	18,2	12			
Total	**23**	**69,7**	**10**	**30,3**	**33**	**100**		

Based on Table 3.3, it can be seen that of the 21 respondents with poor physical activity levels, 17 (51.5%) had hypertension, whilst of the 12 respondents with good physical activity levels, 6 (18.2%) had hypertension.

3.2.2 The relationship between dietary knowledge and the incidence of hypertension.

Tabel 3.4 The Relationship Between Dietary Knowledge and the Incidence of Hypertension in the Rangkasbitung Community Health Centre (PKM) Service Area..

Dietary Knowledge	Incidence of Hypertension				TOTAL	%	P Value	OR (95% CI)
	Hypertension	%	Non Hypertension	%				
	N		N					
Poor	12	36,4	7	21,2	19	100	0,017	0,05
Good	11	33,3	3	9,1	14			
Total	**23**	**69,7**	**10**	**30,3**	**33**	**100**		

Table 3.4 shows that of the 19 respondents with poor knowledge of the hypertension diet, 12 (36.4%) had hypertension, whilst 14 respondents had good knowledge of the hypertension diet, and 11 (33.3%) had hypertension.

3.3 Discussion

This study aims to analyse the relationship between physical activity and dietary knowledge among older adults with hypertension. Hypertension itself is a serious global health problem, with prevalence figures continuing to rise; it is estimated to affect 1.5 billion people by 2025 [21]. This condition is often referred to as the ‘silent killer’ because it frequently shows no symptoms until it leads to serious complications such as heart disease, stroke, and kidney failure[22].

Based on the findings of this study, physical activity is significantly associated with the incidence of hypertension in older adults. These results are consistent with a study [23] which demonstrated an association between physical activity/exercise and the incidence of hypertension (p-value = 0.001). Older adults who are physically inactive tend to have a higher risk of developing hypertension. This is supported by study [24] which states that a lack of physical activity is one of the factors influencing blood pressure in older adults. Regular physical activity, such as Prolanis exercises, has been shown to be effective in lowering blood pressure in people with hypertension [25].

In addition to physical activity, dietary knowledge also shows a strong association with the management of hypertension in older adults. A good level of knowledge about healthy diets, particularly low-salt diets, is crucial for controlling blood pressure. Research by [26] confirms that knowledge has a significant association with the incidence of hypertension. Older adults with poor dietary knowledge often consume high-salt foods, which directly contribute to increased blood pressure [27]A low-salt diet and the DASH (Dietary Approaches to Stop Hypertension) diet have been shown to be effective in lowering blood pressure in patients with hypertension [8].

Other findings indicate that the majority of older adults in this study had a reasonable level of knowledge regarding diet and physical activity, yet the extent to which this knowledge is put into practice in their daily lives varies. This indicates a gap between knowledge and practice. Adherence to diet and physical activity is a key component of self-management of hypertension [26]. Ongoing education and support are required to translate knowledge into consistent behaviour [28].

3.4 Comparison with Previous Theories and Research.

The results of this study are consistent with various theories and previous research on risk factors and the management of hypertension in older adults. The Health Belief Model (HBM) theory emphasizes that perception. The findings of this study are consistent with various theories and previous research on risk factors and the management of hypertension in older adults. The Health Belief Model (HBM) emphasises that individuals’ perceptions of the threat of disease and the benefits of preventive measures will influence their health behaviours [29]. In this context, older adults who understand the risks of hypertension and the benefits of physical activity and a healthy diet are more likely to adopt

such behaviours. However, the HBM also indicates that implementation in practice remains rare, suggesting a need for more effective educational strategies [9].

Previous research has consistently shown that physical activity is one of the key pillars in the prevention and management of hypertension. A lack of physical activity is a significant risk factor [23]. Physical activity recommendations for older adults with hypertension often include regular light to moderate exercise, such as prolanis exercises, which have been shown to lower blood pressure [25]. Indeed, physical activity can help improve the overall quality of life for older adults [30].

Similarly, the importance of dietary knowledge in the management of hypertension has been well documented. High salt intake is directly linked to the incidence of hypertension [6]. A study by [31] specifically compared the effectiveness of a low-salt diet and the DASH diet, showing that both were effective in lowering blood pressure, with the DASH diet demonstrating a more significant reduction in diastolic blood pressure. This underscores the importance of education regarding the appropriate type of diet, rather than merely restricting salt intake.

Research on knowledge also indicates a strong association with treatment adherence and attitudes towards the prevention of complications. For example,[32] found a significant association between knowledge levels and medication adherence in patients with hypertension. Similarly, [3] found a very strong association between knowledge of hypertension and attitudes towards the prevention of complications.[33] also found an association between the knowledge of hypertensive patients and their use of the Integrated Health Promotion Post (POSBINDU) for non-communicable diseases (NCDs), which is a vital tool for education and early detection.

Overall, the findings of this study are consistent with the existing literature, reinforcing the argument that physical activity and dietary knowledge are two crucial components in the management of hypertension in the elderly population. However, this study also highlights the need to bridge the gap between knowledge and practice, given that knowledge alone does not always guarantee behavioural change [9]

3.5 Factors Influencing the Relationship

The relationship between physical activity, dietary knowledge and hypertension in older adults is highly complex and influenced by various factors. Firstly, educational attainment is often correlated with levels of health knowledge. Older adults with higher levels of education tend to have better access to information and a deeper understanding of the importance of a healthy lifestyle, including physical activity and diet [34]. Nevertheless, research [22] indicates that respondents' educational levels do not always show a significant association with the incidence of hypertension, which may suggest that access to information alone is insufficient without motivation and supportive facilities.

Secondly, support from family and the social environment plays a crucial role. Older adults who receive emotional and practical support from their families tend to be more compliant with recommended diets and physical activity [35]. Although [36] found no significant association between family emotional support and dietary compliance among older adults, these findings may have been influenced by the specific context of that study and should be interpreted with caution. In general, social support, whether from family or the community (for example, through the PROLANIS or POSBINDU programmes), can increase older adults' participation in health programmes and adherence to a healthy lifestyle [37].

Thirdly, the general health status of older adults, such as the presence of other comorbidities (e.g. diabetes mellitus or dyslipidaemia), can affect their ability and motivation to engage in physical activity and follow specific diets [38]. Declining organ function due to ageing can also be a barrier [39]. Furthermore, psychological factors such as stress can also contribute to the development of hypertension and affect motivation to adopt healthy behaviours [22].

Fourthly, access to healthcare facilities and information is crucial. The availability of community health centres, health posts and health education programmes (such as those run by community health workers) can improve knowledge and help older people adopt a healthy lifestyle [40]. Access to dietitians for dietary counselling is also important so that patients can better understand the dietary requirements for managing hypertension [7].

Fifthly, diet and overall lifestyle have a significant impact on this relationship. In addition to salt intake, other dietary factors such as animal protein, cholesterol, saturated fatty acids, and fibre, as well

as central obesity, also have a significant association with hypertension [41]. Smoking and alcohol consumption are also established risk factors [22]. Therefore, a holistic approach that takes into account all aspects of lifestyle is necessary for effective hypertension management.

3.6 Limitations of the Study

Although this study provides insights into the relationship between physical activity and dietary knowledge among older adults with hypertension, there are several limitations that need to be acknowledged. Firstly, the study design used—such as the cross-sectional design employed in several reference studies [32], —can only demonstrate an association or correlation, rather than a cause-and-effect relationship. To establish causality, more rigorous longitudinal or experimental studies are required.

Secondly, data on physical activity and dietary knowledge are largely obtained through questionnaires or interviews. These methods are susceptible to recall bias and social desirability bias, whereby respondents may answer in line with what they perceive to be expected, rather than the reality. More objective measures of physical activity, such as the use of accelerometers, or more detailed dietary assessments, such as food diaries over several days, can provide more accurate data.

Thirdly, the sample sizes in some of the reference studies are relatively small (for example, 51 respondents in [42]; 30 respondents in [33], which may limit the generalisability of the results to the wider elderly population. Demographic, socio economic and cultural variations amongst the elderly population may also influence the findings, and these studies may not fully capture such diversity..

Fourthly, this study did not specifically measure the intensity and type of physical activity in detail, which may have influenced its effectiveness in relation to blood pressure. Some studies simply categorise activities as ‘physical activity’ in general, even though the type and duration of the activity are highly significant [25].

Fifthly, other factors known to influence hypertension, such as family history, stress, smoking habits, alcohol consumption, and comorbidities, may not have been fully controlled for or considered in depth in the analysis of the relationship between physical activity and diet [22]. These limitations may affect the interpretation of the relationships found.

Finally, the concept of ‘dietary knowledge’ can be very broad. This study may not have specifically explored the depth of older adults’ understanding of the DASH dietary recommendations, the importance of certain macronutrients and micronutrients, or their ability to put that knowledge into practice in the context of daily life, which may be limited by economic or cultural factors [31].

3.7 Implications of the Research Findings

The findings of this study have significant implications for healthcare practitioners, policymakers and families in efforts to manage hypertension in older adults. Firstly, the clinical implications suggest that interventions focusing on increasing physical activity and dietary education should be a priority in the management of hypertension in older adults. Healthcare workers, particularly geriatric nurses, need to proactively identify older adults with low levels of physical activity and inadequate dietary knowledge. Programmes such as Prolanis exercise should be promoted and widely publicised in community health centres and health posts [25]. Structured and easily understandable nutritional counselling, with an emphasis on a low-salt diet and the DASH diet, should be provided individually or in groups [31].

Secondly, implications for education and further research. The curricula for nursing and other health professions need to strengthen content on geriatric nursing, particularly in the management of chronic conditions such as hypertension, with a focus on non-pharmacological aspects such as physical activity and diet. Future research could employ longitudinal or intervention designs to test the effectiveness of health education and promotion programmes in greater depth. Furthermore, qualitative research could explore the barriers and facilitators for older adults in adopting a healthy lifestyle, as well as the role of family and community support in more detail [36]

Thirdly, the implications for families and communities. Families play a central role in supporting older people to lead a healthy lifestyle. Education is aimed not only at older people with hypertension, but also at their family members so that they can provide emotional and practical support, such as preparing healthy meals or accompanying them whilst exercising [36]. Communities can form peer support groups or facilitate elderly friendly physical activities, thereby creating an environment

conducive to the health of older adults. Raising public awareness of this 'silent killer' is also important so that early detection and prevention can be carried out sooner [22].

4. CONCLUSION

Based on the results of the study and discussion, it can be concluded that there is a relationship between physical activity and dietary knowledge and the incidence of hypertension in the catchment area of the Rangkasbitung Community Health Centre.

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REFERENCES

[1] F. Riyada, S. A. Fauziah, N. Liana, and D. Hasni, "Faktor yang Mempengaruhi Terjadinya Resiko Hipertensi pada Lansia," Scientific Journal, vol. III, pp. 27–47, 2024, [Online]. Available: http://journal.scientic.id/index.php/sciena/issue/view/17

[2] N. Sumarni, U. Rosidin, D. Purnama, I. Shalahhudin, and W. Witdiawati, "Pentingnya Diet Hipertensi pada Lansia Hipertensi di Rw 05 Ciwalen Garut," Jurnal Kreativitas Pengabdian Kepada Masyarakat (PKM), vol. 7, no. 5, pp. 2330–2345, Apr. 2024, doi: 10.33024/jkpm.v7i5.14648.

[3] A. T. Zethira et al., "Hypertension As A Silent Killer Disease: Education For At-Risk Communities In Pekuwon Village," Jurnal Layanan Masyarakat (Journal of Public Services), vol. 8, no. 2, pp. 200–209, Jun. 2024, doi: 10.20473/jlm.v8i2.2024.200-209.

[4] Afina Muharani Syaftriani, Dedi Dedi, and Febrina Febrina, "Hubungan Kepatuhan Minum Obat terhadap Penggunaan Terapi Komplementer pada Pasien Hipertensi di Rumah Sakit Umum Mitra Medika Amplas Medan," NAJ : Nursing Applied Journal, vol. 3, no. 3, pp. 42–55, Jul. 2025, doi: 10.57213/naj.v3i3.802.

[5] K. Delvia Riska Pratiwi et al., "Studi Literatur: Hubungan Aktivitas Fisik dengan Kejadian Hipertensi pada Lansia Literature Study: The Relationship Between Physical Activity and Hypertension in the Elderly Artikel Review," J Jurnal Kolaboratif Sains, vol. 8, no. 12, pp. 8402–8412, 2025, doi: 10.56338/jks.v8i12.9634.

[6] A. Novita Vulandari, P. Studi Ilmu Keperawatan, and S. Dian Husada Mojokerto, "Pemberian Konsumsi Air Kelapa Muda Terhadap Perubahan Tekanan Darah Tinggi Pada Lansia," Jurnal Keperawatan, pp. 173–185, 2025.

[7] R. Asna Oktavia, T. S. Handayani, S. Yulianti, and U. Dehasen Bengkulu, "Hubungan Pola Makan Dan Status Gizi Terhadap Kejadian Hipertensi Pada Lansia Di Wilayah Kerja Puskesmas Surulangun Tahun 2023 The Relationship Between Dietary Patterns And Nutritional Status On The Incidence Of Hypertension In Elderly People In The Working Area Of The Surulangun Community Health Center In 2023," 2026.

[8] D. Retnaningsih and R. Amalia, "Penerapan Mengkonsumsi Air Rebusan Daun Sirsak Terhadap Penurunan Kadar Asam Urat Pada Lansia: Case Study," Jurnal Manajemen Asuhan Keperawatan, vol. 6, no. 2, pp. 1–5, 2022.

[9] H. F. Sakr, S. R. Sirasanagandla, S. Das, A. I. Bima, and A. Z. Elsamanoudy, "Insulin Resistance and Hypertension: Mechanisms Involved and Modifying Factors for Effective Glucose Control," Aug. 01, 2023, Multidisciplinary Digital Publishing Institute (MDPI). doi: 10.3390/biomedicines11082271.

[10] K. Madan and J. P. S. Sawhney, "Exercise and lipids," Mar. 01, 2024, Elsevier B.V. doi: 10.1016/j.ihj.2023.11.270.

[11] U. A. Sukrillah, S. Mulidah, A. Asrin, and M. Munjiati, “Edukasi dan Pelatihan Senam Anti Stroke untuk Masyarakat dengan Hipertensi,” Jurnal Kreativitas Pengabdian Kepada Masyarakat (PKM), vol. 7, no. 6, pp. 2427–2438, Jun. 2024, doi: 10.33024/jkpm.v7i6.14305.

[12] M. F. Farhani, M. Maryoto, and T. Sumarni, “Upaya Peningkatan Pengetahuan tentang Diet Hipertensi pada Lansia,” Kolaborasi: Jurnal Pengabdian Masyarakat, vol. 5, no. 6, pp. 947–952, Oct. 2025, doi: 10.56359/kolaborasi.v5i6.712.

[13] M. Masyudi, “Faktor yang berhubungan dengan perilaku lansia dalam mengendalikan hipertensi,” AcTion: Aceh Nutrition Journal, vol. 3, no. 1, p. 57, Jul. 2018, doi: 10.30867/action.v3i1.100.

[14] B. Kaneshia Siregar, N. Ainul Shifa, and A. Info, “The Relationship between Family Support and Hypertension Diet Compliance in the Elderly at the Al Fatima Elderly Posbindu, Cibeber Community Health Center, Cianjur in 2025,” JICN: Jurnal Intelek dan Cendikiawan Nusantara, vol. 3, pp. 1424–1436, 2025, [Online]. Available: https://jicnusantara.com/index.php/jicn

[15] N. Hadi Purwanto, P. Studi Ilmu Keperawatan, S. Dian Husada Mojokerto, and S. Tinggi Ilmu Kesehatan Husada Jombang, “MENURUNKAN KELUHAN NYERI KEPALA PADA LANJUT USIA DENGAN HIPERTENSI MENGGUNAKAN KOMPRES HANGAT.”

[16] A. Novita Vulandari, P. Studi Ilmu Keperawatan, and S. Dian Husada Mojokerto, “PEMBERIAN KONSUMSI AIR KELAPA MUDA TERHADAP PERUBAHAN TEKANAN DARAH TINGGI PADA LANSIA,” 2025.

[17] F. Yestelda Rebokh, R. Eva Rayanti, and catherine Natawirrarindy, “Hubungan Perawat Edukator, Manajemen Hipertensi Dan Usia Pada Lansia,” Kendal, Jun. 2024. [Online]. Available: http://journal.stikeskendal.ac.id/index.php/Keperawatan

[18] R. Ferdi, Sartika Tri Citra Rianita, and Sari Aulia Finka, “Edukasi Penerapan Air Rebusan Seledri Terhadap Manajemen Nyeri Pasien Lansia Dengan Hipertensi,” Lentera Perawat, vol. 3, no. 2, pp. 51–58, 2022.

[19] T. Aniamarta, A. Salsabilla Huda, and F. Lizariani Aqsha, “Causes and Treatments of Heart Attack,” BIOLOGICA SAMUDRA, vol. 4, no. 1, pp. 22–31, Jul. 2022, doi: 10.33059/jbs.v4i1.3925.

[20] E. Yuswatiningsih, E. Ekayamti, D. Lukitaningtyas, H. Daris Sa, and R. Nisak, “Edukasi Kesehatan Sebagai Upaya Peningkatan Manajemen Diri Pasien Hipertensi Di Puskesmas Kasreman Kabupaten Ngawi,” Jurnal Pengabdian Kepada Masyarakat Bidang Ilmu Keperawatan Optimal |, vol. 3, no. 1, pp. 47–55, 2026.

[21] V. Astuti, P. Studi Keperawatan, and F. Ilmu Kesehatan, “Pengetahuan dengan Sikap Kepatuhan Lansia Menjalankan Diet Hipertensi Knowledge and Compliance with a Hypertension Diet Among Elderly Patients,” Jurnak Keperawatan Profesional, vol. 6, no. 2, pp. 367–375, Nov. 2025, doi: 10.36590/kepo.v6i2.1630.

[22] T. Yahya Christina, Keperawatan Komunitas, Keluarga dan Gerontik. Cilacap: PT MEDIA PUSTAKA INDO, 2025. [Online]. Available: www.mediapustakaindo.com

[23] N. Putu, A. I. Eliani, L. Gede, S. Yenny, N. Made, and H. Sukmawati, “Aktivitas Fisik Sehari-hari Berhubungan dengan Derajat Hipertensi pada Pra Lansia dan Lansia di Wilayah Kerja Puskesmas I Denpasar Timur,” Aesculapius Medical Journal |, vol. 2, no. 3, pp. 188–194, 2022.

[24] M. Manungkalit, N. Novita Sari, N. Andi Puput Novita, F. Keperawatan Universitas Katolik Widya Mandala Surabaya, and M. Fakultas Keperawatan Universitas Katolik Widya Mandala Surabaya, “Pengaruh Aktivitas Fisik Terhadap Tekanan Darah Pada Lansia Dengan Hipertensi,” Jurnal Penelitian Kesehatan, vol. 14, pp. 1–8, Jun. 2024.

[25] M. Meisyaroh Syamson, N. Fitri, P. Studi Ilmu Keperawatan Stikes Muhammadiyah Sidrap, S. Rappang, and S. Selatan, “Pengaruh senam prolanis terhadap penurunan tekanan darah pada penderita hipertensi,” Holistik Jurnal Kesehatan, vol. 14, no. 1, pp. 74–81, 2020.

[26] L. A. Wijayanti, R. Indriani, G. A. Salomon, R. Asrina, M. P. Nur, and S. Suprapto, “Knowledge and Attitudes With the Incidence of Hypertension,” Jurnal Ilmiah Kesehatan (JIKA), vol. 5, no. 2, Aug. 2023, doi: 10.36590/jika.v5i2.512.

[27] H. Haron, N. A. F. Kamal, H. M. Yahya, and S. Shahar, “Knowledge, Attitude and Practice (KAP) of Malay Elderly on Salt Intake and Its Relationship With Blood Pressure,” Front. Public Health, vol. 8, Feb. 2021, doi: 10.3389/fpubh.2020.559071.

[28] V. Surani, Lilik Pranata, Teresia Erina Sestiyowati, Dini Anggraini, and Sindi Ernawati, “Relationship between Family Support and Self-Care in Hypertension Patients,” Formosa Journal of Multidisciplinary Research, vol. 1, no. 7, pp. 1447–1458, Nov. 2022, doi: 10.55927/fjmr.v1i7.1784.

[29] S. N. Alkhoiriyah, E. Safariyah, and H. Hadiyanto, “The Effect of Health Education Based on the Health Belief Model (HBM) Approach on Increasing Motivation to Take Medication in Pulmonary TB Patients in Sindangsari Village,” Jurnal Pengabdian Ilmu Kesehatan, vol. 6, no. 1, 2026, doi: 10.55606/jpikes.v6i1.6667.

[30] N. Hasanah et al., “Latihan Fisik Pada Kelompok Lansia Di Puskesmas Mulyoharjo Pemalang,” Calory Journal : Medical Laboratory Journal, vol. 1, no. 4, 2023.

[31] V. N. Tejani et al., “The Relationship Between Dietary Fiber Intake and Blood Pressure Worldwide: A Systematic Review,” Cureus, Sep. 2023, doi: 10.7759/cureus.46116.

[32] N. Indriana, M. Tri Kumala Swandari, and Y. Pertiwi, “Hubungan Tingkat Pengetahuan Dengan Kepatuhan Minum Obat Pada Pasien Hipertensi Di Rumah Sakit X Cilacap,” Journal of Pharmacy UMUS, vol. 2, no. 01, pp. 1–10, 2020.

[33] D. Z. Fuadah and N. F. Rahayu, “Pemanfaatan POS Pembinaan Terpadu (POSBINDU) Penyakit tidak Menular (PTM) pada Penderita Hipertensi,” Jurnal Ners dan Kebidanan (Journal of Ners and Midwifery), vol. 5, no. 1, pp. 020–028, Apr. 2018, doi: 10.26699/jnk.v5i1.art.p020-028.

[34] T. Qin, P. Wei, and Y. Xie, “Does education level affect the health status of the elderly? The chain mediating effect of internet use, health behavior and social class identity,” PLoS One, vol. 20, no. 2 February, Feb. 2025, doi: 10.1371/journal.pone.0319389.

[35] S. Redjeki, W. Ahli Muda, and P. Kesos, “Dukungan Keluarga bagi Kesejahteraan Sosial Lanjut Usia,” Jurnal PUSDIKLAT KESOS, vol. 18, pp. 87–97, Nov. 2021.

[36] D. Rahmatika, “The Correlation Of Emotional Support And Elderly Diet Compliance With Hypertension,” The Indonesian Journal of Public Health, vol. 14, pp. 252–262, May 2019, doi: 10.20473/ijph.vl14il.2019.252-262.

[37] D. Rasyid et al., “Pengaruh Dukungan Sosial terhadap Kepatuhan Lansia dalam Mengikuti Program Posyandu Lansia,” Barongko Jurnal Ilmu Kesehatan, vol. 3, pp. 1059–1070, Jul. 2025.

[38] Y. Huang, Z. Sun, J. Lan, and Y. Wen, “Association rule analysis of physical activity and multimorbidity in middle-aged Korean adults with diabetes: an evidence to promote active lifestyles,” BMC Public Health, vol. 26, no. 1, Dec. 2026, doi: 10.1186/s12889-026-26603-1.

[39] A. R. Mutnawasitoh and D. Mirawati, “Program Pengembangan Ligabel (Lansia Jaga Balance) Tahap Edukasi dan Screening Resiko Jatuh Lansia di Surakarta,” 2024. [Online]. Available: https://dmi-journals.org/jai/

[40] H. Ulfah et al., “Efektivitas Program Pos Pembinaan Terpadu (POSBINDU) Di Desa Murung Jambu Kecamatan Paringin Selatan Kabupaten Balangan,” Al Lidra Balad Jurnal Administrasi Negara, vol. 7, pp. 918–931, 2026.

[41] S. J. Dicken and R. L. Batterham, “The role of diet quality in mediating the association between ultra-processed food intake, obesity and health-related outcomes: A review of prospective cohort studies,” Jan. 01, 2022, MDPI. doi: 10.3390/nu14010023.

[42] J. Purwono et al., “Pola Konsumsi Garam Dengan Kejadian Hipertensi Pada Lansia Salt Consumption Pattern With Hypertension In Elderly,” Jurnal Wacana Kesehatan, vol. 5, no. 1, 2020.