an idea health journal
ISSN (online): 2797-0604

A Cross-Sectional Study of Blood Pressure Difference in Hypertensive Patients

Volume 6 No 3, Page 492-501
©The Author(s) 2026

OPEN ACCESS

Ferly Yacoline Pailungan [*1], **Ayuk Cucuk Iskandar**[1], **Najihah**[1], **Ana Damayanti**[1]

[1*] Department of Nursing, Faculty of Health Science, Universitas Borneo Tarakan, Tarakan City, Indonesia

Article Info:
Received: 21 February, 2026
Revised: 15 May, 2026
Accepted: 16 May, 2026

Correspondence Author:
Ferly Yacoline Pailungan, Faculty of Health Science, Universitas Borneo Tarakan. 77123
Email: ferly.y_pailungan@borneo.ac.id

How to Cite:
Pailungan FY, Iskandar AC, Najihah N, Damayanti A. A Cross-Sectional Study of Blood Pressure Difference in Hypertensive Patients. An Idea Health Journal.2026; 6(03): 492-501. https://doi.org/10.53690/ihj.v6i03.679

This is Work Licensed by: https://creativecommons.org/licenses/by/4.0/

Abstract

Background: Hypertension is a major global health challenge due to its rising prevalence and potential for severe complications. This study analyzed differences in blood pressure among hypertensive patients with and without a medication supervisor

Methods: A quantitative, non-experimental, cross-sectional study was conducted at PKM "X" in Tarakan City. Medication supervisors were defined as family members who monitored patients' adherence to medication. The sample included 89 hypertensive patients selected through purposive sampling. Data collection involved interviews and direct blood pressure measurements using a calibrated sphygmomanometer. Bivariate analysis was conducted using the unpaired T-test and Mann-Whitney test.

Results: The findings indicate a significant association between medication supervision and systolic blood pressure control. Patients with medication supervisors had a significantly lower mean systolic blood pressure (143.0 ± 16.3 mmHg) than those without supervisors (153.7 ± 16.5 mmHg; $p = 0.003$, $\alpha = 0.05$). The mean difference was 10.7 mmHg (95% CI: 3.7–17.7), with a medium-to-large effect size (Cohen's $d = 0.65$), demonstrating both statistical and clinical significance. No significant difference was observed in diastolic blood pressure between the group with a medication supervisor (85.1 ± 14.3 mmHg) and the group without (85.5 ± 11.2 mmHg, $p = 0.322$). These results indicate that the presence of a medication supervisor is a key factor in optimizing systolic blood pressure regulation.

Conclusion: A significant difference in blood pressure, particularly systolic blood pressure, was observed between hypertensive patients with and without medication supervision.

Keywords: Blood Pressure, Hypertension, Medication Supervisor

BACKGROUND

Hypertension is defined as a systolic blood pressure exceeding 139 mmHg and a diastolic blood pressure exceeding 89 mmHg. It represents a significant global health concern due to its often asymptomatic nature, which can lead individuals to remain unaware of their condition and maintain normal activities. Consequently, hypertension is frequently referred to as a silent killer (1,2).

Hypertension continues to be a major non-communicable disease with a high global prevalence. According to the World Health Organization (WHO), 1.13 billion individuals worldwide were affected by hypertension in 2015, with only 36.8% documented as using antihypertensive medications. WHO data from 2023 further indicate that hypertension remains a leading cause of mortality globally. Approximately 1.28 billion adults aged 30 to 79 are estimated to have hypertension, with 46% unaware of their condition and only 42% having received a diagnosis and treatment (3).

The 2023 Indonesian Health Survey (SKI) reported a hypertension prevalence of 30.8% among individuals aged 17 years and older. The survey also revealed that 36.4% of patients take their medication irregularly, while 16.9% do not take it at all. These findings suggest that a substantial proportion of individuals with hypertension in Indonesia either do not receive adequate treatment or are inconsistent in adhering to therapy. Additionally, North Kalimantan Province was identified as one of the top 10 provinces with the highest prevalence of hypertension. This situation represents a significant regional health burden, as high incidence rates are not matched by optimal medication adherence. Without effective interventions, the risk of complications such as heart disease, stroke, and kidney failure in North Kalimantan is expected to increase (4).

Uncontrolled blood pressure significantly elevates the risk of cardiovascular complications. Despite the availability of effective pharmacological therapies, many patients do not achieve target blood pressure levels due to poor adherence. The Medication Adherence Framework posits that patient behavior is influenced by the interplay of personal factors, social support, and the healthcare system. Within this framework, adherence is understood not simply as medication intake, but as a response to perceived barriers and available support (5-9).

Multiple studies have demonstrated that patients with poor adherence consistently exhibit uncontrolled blood pressure during clinical visits (10-12). Factors influencing adherence include age, education, motivation, and family support (13-15). In hypertension management, family support is often operationalized through family members serving as medication supervisors, who monitor therapy and ensure timely and accurate medication intake. While the importance of social support is well established, there is a notable research gap concerning the magnitude of clinically significant differences in blood pressure between patients with and without medication supervision, particularly in urban coastal populations with distinct sociocultural characteristics.

Previous studies have indicated that patients with medication supervisors generally demonstrate better adherence and improved blood pressure control (11, 16, 17). However, direct comparative research on blood pressure values between patients with and without medication supervisors is necessary to substantiate the effectiveness of this family-based intervention. The present study aims to assess differences in blood pressure among hypertensive patients with and without medication supervisors. The findings are expected to provide empirical evidence supporting the importance of family support in chronic disease management and to inform public health education regarding the role of medication supervisors. Ultimately, these efforts may help reduce the risk of complications and enhance the quality of life for residents of Tarakan, North Kalimantan.

METHODS

Study Design

This research is a quantitative study with an analytical observational approach. This study uses a cross sectional design.

Sample/Participans

The study population comprised 138 hypertensive patients in the working area of PKM "X," Tarakan City. The sampling technique used was non-probability purposive sampling. The population was divided into two strata based on the presence of a medication supervisor. The researchers included all patients with a medication supervisor in one group (45 patients) and an equal number from the group without a medication supervisor (45 patients). However, during data collection, one respondent from the group with a medication supervisor withdrew, bringing the total number of respondents to 89. The study defined inclusion and exclusion criteria for respondents. Inclusion criteria included hypertensive patients who regularly visited PKM "X," had received antihypertensive therapy for at least one month, and were willing to participate. For one group, an additional inclusion criterion was the presence of a supervisor or companion for medication administration. Patients who were uncooperative or did not complete the questionnaire were excluded from the study. To control for potential confounding variables, the researchers applied the same inclusion criteria to the groups with and without medication monitors and matched the two groups on similar criteria, such as age and gender. This ensured that differences in blood pressure were more likely due to the presence of a medication supervisor than to differences in other demographic data.

Data Collection

The data collection process was conducted systematically through several steps. First, administrative and ethical clearance was obtained from the relevant authorities and the Ethics Committee. Subsequently, permission was presented to the head of PKM "X" Tarakan City to coordinate the research schedule and facilitate access to patient data. Potential respondents were identified by reviewing patients' medical records at the health center to confirm eligibility according to the inclusion criteria. After identification, the study's objectives and procedures were explained to eligible patients during their visit to the health center. Those who agreed to participate provided written informed consent. Structured interviews were then conducted to determine whether a medication supervisor was present and to collect demographic information. Respondents also completed a questionnaire to provide additional details regarding their medication management. To ensure data accuracy, blood pressure was measured directly by the researcher using a single calibrated sphygmomanometer, with each patient measured once in a seated position after a brief rest. All measurement results and interview findings were carefully recorded on observation sheets for subsequent analysis. Data collection was conducted from July to August 2024.

Data Analysis

The data analysis in this study was univariate and bivariate. Univariate analysis examined the characteristics of respondents in two groups: hypertensive patients with medication supervisors and hypertensive patients without medication supervisors, along with their average blood pressure. Bivariate analysis was conducted to test the research hypothesis, namely, whether there is a difference in average blood pressure between the group with medication supervisors and the group without them. The hypothesis test in this study was the independent t-test and its alternative, the Mann-Whitney test. The data analysis was conducted using SPSS 22.

Ethical Considerations

Prior to data collection, a research permit application was submitted to the Faculty of Health Sciences, UBT, addressed to PKM "X" Tarakan City, along with an ethical review submission to the Health Research Ethics Committee of the Faculty of Health Sciences, Universitas Borneo Tarakan. All ethical principles were strictly followed, including collecting data only after obtaining permission from PKM "X." Informed consent was obtained from all respondents after a comprehensive explanation of the study; respondents voluntarily signed the consent form, and data confidentiality was maintained throughout the research process. Observations and measurements of respondents' blood pressure were conducted, with the sphygmomanometer calibrated prior to use. Blood pressure measurements adhered to standard operating procedures. Ethical approval for this research was granted by the Health Research Ethics Committee of the Faculty of Health Sciences, University of Borneo Tarakan, under approval number 084/01/KEPK-FIKES UBT/V.

RESULT AND DISCUSSION

RESULT

Participants Characteristics

The distribution of respondents' frequency characteristics, including age, gender, and education, is shown in Table 1. The table presents the distribution of respondents by age as follows: The average age of respondents overall is 60 years; among respondents with medication supervisors, the average is 60.2, while among those without medication supervisors, the average is 59.9. So there is no significant difference between the two groups based on age. By gender, the largest percentage of respondents was female, totaling 48 (53.9%). In the group with medication supervisors, the number of males and females is equal, whereas in the group without medication supervisors, the majority of respondents are women, totaling 26 (29.2%). By education level, the largest share of respondents in both groups is those with an elementary school education, totaling 34 people (38.2%). The level of basic education in the groups with and without medication supervisors is the same, with each group having 17 individuals (19.1%).

Table 1. Frequency distribution of respondent characteristics by group (n = 89)

Data	Group with medication supervisor(n=44)	Group without medication supervisor(n=45)	Total
Age			
Mean (SD)	60.2 (±8.06)	59.9 (±7.80)	60.0 (±7.89)
Min-Max	49-78	46-75	46-78
Gender			
Male	22 (24.7%)	19 (21.4%)	41 (46.1%)
Female	22 (24.7%)	26 (29.2%)	48 (53.9%)
Total	44 (49.4%)	45 (50.6%)	89 (100)
Education			
Bachelor	3 (3.4%)	2 (2.2%)	5 (5.6%)
Senior High School	11 (12.4%)	13 (14.6%)	24 (27.0%)
Junior High School	10 (11.2%)	9 (10.1%)	19 (21.3%)
Elementary School	17 (19.1%)	17 (19.1%)	34 (38.2%)
None	3(3.4%)	4 (4.5%)	7 (7.9%)
Total	44 (49.4%)	45 (50.6%)	89 (100)

Description of the Average Blood Pressure of Hypertensive Patients with Medication Supervisors Compared to Those Without Medication Supervisors. The depiction of blood pressure, both systolic and diastolic, in hypertensive patients with a medication supervisor compared with those without is shown in Table 2. This table shows a difference in systolic and diastolic blood pressure between the two groups. In the group with medication supervision, the average systolic blood pressure was 143 mmHg, and the diastolic blood pressure was 85.1 mmHg. Meanwhile, the average blood pressure in the group without medication supervision was higher, with a systolic pressure of 153.7 mmHg and a diastolic pressure of 85.5 mmHg.

Table 2. Description of Systolic and Diastolic Blood Pressure of Respondents by Group (n=89)

	Group with medication supervisor (n=44)	Group without medication supervisor (n=45)
Systolic Blood Pressure		
Mean (SD)	143.0 (±16.3)	153.7 (±16.5)
Min – Max	112 -189 mmHg	120-200 mmHg
Diastolic Blood Pressure		
Mean (SD)	85.1 (±14.3)	85.5 (±11.2)
Min - Max	61-148 mmHg	57-106 mmHg

Note: n = sample size ; Min = Minimal; Max = Maximal; SD= Standard Deviation

Bivariate Analysis

The difference in systolic blood pressure between the group with medication supervision and the group without medication supervision is presented in Table 3. The statistical analysis using an independent (unpaired) t-test yielded a p-value of 0.003. Since the p-value is less than the significance level ($\alpha = 0.05$), there is a statistically significant difference in systolic blood pressure between hypertensive patients with medication supervision and those without. The mean difference between the two groups was 10.7 mmHg, with a 95% Confidence Interval (CI) of 3.7 to 17.7 mmHg. Furthermore, the calculated Cohen's d effect size was 0.65, indicating a medium-to-large effect. Because the average systolic difference exceeds the clinical significance threshold of 10 mmHg and the CI does not cross zero, it can be concluded that medication supervision provides both a statistically and clinically significant benefit in managing systolic blood pressure among hypertensive patients.

Table 3. Analysis of the difference in systolic blood pressure between respondents in the group with a medication supervisor and respondents in the group without a medication supervisor

Group	*Mean (SD)*	*p-value*	*Mean difference (CI 95%)*	*Effect Size (cohen's d)*
Systolic blood pressure (Group with medication supervisor n=44)	143.0 (±16.3)	0.003	10.7 mmHg	0.65
Systolic blood pressure (Group without medication supervisor n=45)	153.7 (±16.5)			

Note :independent t-test; n = sample size; SD= Standard Deviation CI= Confidence interval

Table 4 displays the results of the Mann-Whitney U test, revealing a p-value of 0.322. Since the p-value exceeds the significance level (α = 0.05), there is no statistically significant difference in diastolic blood pressure between hypertensive patients with a medication supervisor and those without. Although a clinical difference in average diastolic blood pressure exists—with the supervisor group showing a lower average than the group without a supervisor—the margin is minimal at 0.4 mmHg. The 95% Confidence Interval (CI) for this difference was -5.2 to 6.0, which includes zero, further confirming the lack of statistical significance. Additionally, Cohen's d effect size was 0.03, categorized as a negligible effect. This suggests that while medication supervision has a substantial impact on systolic regulation, its influence on diastolic blood pressure in this study population is neither statistically nor clinically significant.

Table 4. Analysis of the difference in diastolic blood pressure between respondents in the group with a medication supervisor and respondents in the group without a medication supervisor.

Group	*Mean (SD)*	*p-value*	*MD(CI 95%)*	*EffectSize(cohen's d)*
Diastolic blood pressure (Group with medication supervisor n=44)	85.1 (±14.3)	0.322	0.4 mmHg	0.03
Diastolic blood pressure (Group without medication supervisor n=45)	85.5 (±11.2)			

NOTE :Mann-Whitney test; n = sample size; SD= Standard Deviation;CI= Confidence interval

DISCUSSION

The research results detailed the respondents' characteristics by age, gender, and education. The average age of hypertensive patients was 60 years, aligning with previous studies that report the highest incidence of hypertension among individuals aged 60 years and above (18). This prevalence is attributed to decreased vascular elasticity in older adults, which leads to vascular stiffness and contributes to elevated blood pressure (5,7,19). The study also found that women constituted the majority of hypertension patients. This predominance is associated with hormonal changes following menopause. The decline in estrogen levels after menopause leads to reduced HDL levels, which facilitates plaque accumulation on blood vessel walls and may result in hypertension and heart disease (20). These findings are consistent with previous research indicating that most hypertensive patients are female and either elderly or postmenopausal (21).

Analysis of respondents by education level indicated that most participants had only an elementary school education. This finding aligns with research by Baringbing (22), which demonstrates the impact of educational attainment on the incidence of hypertension. Individuals with lower educational levels are more likely to experience hypertension than those with higher education, a trend attributed to limited knowledge regarding hypertension prevention, symptoms, and risk factors (23). Sun (24) also reported that individuals with elementary education are at greater risk for hypertension and exhibit poorer blood pressure control compared to those with at least junior high school education.

The bivariate analysis revealed a significant difference in average blood pressure between hypertensive patients with medication supervision and those without. This difference was most pronounced in systolic blood pressure, with supervised patients demonstrating better control and lower systolic values. Previous research supports these findings, indicating that medication supervision enhances treatment adherence and improves blood pressure control in hypertensive patients (25,26). The use of pill cards as a medication supervision tool has also been shown to increase adherence to

antihypertensive therapy (27). Furthermore, monitoring medication adherence through mobile platforms, including phone calls, animated videos, voice messages, and written reminders, has been found to improve patient compliance and engagement in treatment programs (28,29). Additional strategies, such as medication reminder boxes and family support, significantly improve adherence and result in better control of both systolic and diastolic blood pressure (30). These results are consistent with the present study, which found that patients without medication supervision generally exhibit higher blood pressure levels, particularly systolic pressure.

These findings highlight the critical role of monitoring medication intake among patients with hypertension, both through direct supervision and mobile media, to improve awareness and adherence to prescribed regimens. Patients who receive supervision in medication administration demonstrate superior blood pressure control compared to those without such guidance. As a chronic condition, hypertension necessitates sustained therapy management, often requiring lifelong antihypertensive medication. Supervision contributes to greater consistency in therapy adherence. Multiple studies have demonstrated that patients who receive supervision or support within treatment programs exhibit higher adherence rates, which are directly associated with improved blood pressure control. Medication adherence is shaped by factors such as patient education, psychological support, and social or environmental influences. Evidence suggests that non-adherence frequently results from insufficient knowledge regarding the significance of hypertension treatment and the potential complications arising from uncontrolled blood pressure (31-33).

Medication supervisors for patients with hypertension function not only as reminders for medication schedules but also as sources of support and education. The educational role of medication supervisors is supported by several studies, which report that patients receiving instruction on hypertension management including lifestyle modifications, dietary changes, and increased physical activity experience significant reductions in both systolic and diastolic blood pressure compared to those who do not receive such education (34-36).

Family members may serve as medication supervisors, offering essential support to patients with hypertension. This form of support has proven to be an effective strategy for enhancing medication adherence. One study involving family participation in adherence interventions reported significant improvements in blood pressure control (29). Elevated levels of family support can motivate patients to maintain their treatment regimens. Consequently, involving family members as medication supervisors can facilitate more effective implementation of treatment programs for hypertensive patients.

Despite the significant findings regarding the role of medication supervisors, several limitations of this study should be noted. First, the cross-sectional design enables identification of associations but does not establish a definitive causal relationship between medication supervision and blood pressure control. Second, although groups were matched by age and gender to minimize bias, other confounding variables such as duration of hypertension, lifestyle habits, and comorbidities were not fully controlled and may independently affect blood pressure outcomes. Additionally, blood pressure measurements were obtained during a single clinical visit, which may not reflect daily fluctuations. Finally, the use of purposive sampling at a single health center may restrict the generalizability of these findings to broader populations with differing characteristics.

CONCLUSION

This study found that hypertensive patients with a medication supervisor had significantly lower systolic blood pressure than those without one. Having a supervisor was linked to better blood pressure control. These results suggest that support from family or others through direct supervision can help patients stick to their treatment, which may improve their quality of life and help prevent complications.

ACKNOWLEDGEMENT

The researcher extends their deepest gratitude to the head of the PKM "X" in Tarakan City for granting permission to conduct the research. The researchers also extend their gratitude to the staff and healthcare workers at the community health center, as well as all parties who have contributed to data collection and supported this research. Thank you to all the patients who were willing to be respondents.

AUTHOR'S CONTRIBUTION STATEMENT

FYP: Conceptualization, Methodology, Conducts Research, Supervision, Writing-Original Draft, Validasi, Formal Analysis,Review & Editing. ACI : , Conducts Research, Project Administration, Review & Editing. N : Methodology & Manuscript review, AD: Review & Editing, Manuscript review

CONFLICT OF INTEREST

None.

DECLARATION OF GENERATIVE AI AND AI-ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

The Authors acknowledge the use of AI-Assisted Technologies to support language improvement, improve clarity, and improve the overall readability and structure of the manuscript.

FUNDING

This study receives funding from Universitas Borneo Tarakan.

DATA AVAILABILITY

The dataset generated and analyzed during the current study is available from the corresponding author upon request.

REFERENCES

1. Unger T, Borghi C, Charchar F, Khan NA, Poulter NR, Prabhakaran D, et al. 2020 International Society of Hypertension Global Hypertension Practice Guidelines. Hypertension. 2020 Jun;75(6):1334-1357. doi:10.1161/HYPERTENSIONAHA.120.15026.
2. Nurarif AH, Kusuma H. Aplikasi Asuhan Keperawatan Berdasarkan Diagnosa Medis dan NANDA NIC-NOC. Edisi revisi jilid 2. Yogyakarta: Mediaction; 2015.
3. World Health Organization. Hypertension. Geneva: WHO; 2023. Available from: https://www.who.int/news-room/fact-sheets/detail/hypertension
4. Kementerian Kesehatan RI (ID), Badan Penelitian dan Pengembangan Kesehatan. Laporan nasional Riset Kesehatan Dasar 2018. Jakarta: Kementerian Kesehatan RI; 2018.
5. Black JM, Hawks JH. Medical-Surgical Nursing: Clinical Management For Positive Outcomes. 8th ed. St. Louis: Elsevier; 2014.
6. Kardiyudiani NK, Susanti BAB. Keperawatan Medikal Bedah I. Yogyakarta: PT Pustaka Baru; 2019.
7. Smeltzer SC, Bare BG. Brunner & Suddarth's Textbook of Medical-Surgical Nursing. 8th ed. Jakarta: EGC; 2013.
8. Price SA, Wilson LM. Patofisiologi: Konsep Klinis Proses-Proses Penyakit. 6th ed. Jakarta: EGC; 2014.

9. Zhou X, Zhang X, Gu N, Cai W, Feng J. Barriers and Facilitators of Medication Adherence in Hypertension Patients: A Meta-Integration of Qualitative Research. J of Patient Experience.2024. II: 1-17. Doi: 10.1177/23743735241241176
10. Kronish IM, Lynch AI, Oparil S, Whittle J, Davis BR, Simpson LM, et al. The Association Between Anti Hypertensive Medication Non Adherence And Visit-To-Visit Variability Of Blood Pressure: Findings from ALLHAT. Hypertension. 2016;68(1) :39-45. doi:10.1161/HYPERTENSIONAHA.115.06960.
11. Kang CD, Tsang PPM, Li WTL, Wang HHX, Liu KQL, Griffiths SM, et al. Determinants Of Medication Adherence And Blood Pressure Control Among Hypertensive Patients In Hong Kong: A Cross-Sectional Study. Int J Cardiol. 2015;182:250-257. doi:10.1016/j.ijcard.2014.12.064.
12. Kim HJ, Kim BS, Kim H, Lee J, Shin JH, Sung KC. Impact Of Blood Pressure And Medication Adherence On Clinical Outcomes In Patients With Hypertension. Front Med. 2025;12. doi:10.3389/fmed.2025.1564791.
13. Pramana GA, Dianingati RS, Saputri NE. Faktor-Faktor Yang Mempengaruhi Kepatuhan Minum Obat Pasien Hipertensi Peserta Prolanis di Puskesmas Pringapus Kabupaten Semarang. Indones J Pharm Nat Prod. 2019;2(1):52-58. doi:10.35473/ijpnp.v2i1.196.
14. Molintao PW, Ariska, Ambitan RO. Hubungan Dukungan Keluarga Dengan Kepatuhan Minum Obat Pasien Hipertensi Di Puskesmas Towuntu Timur Kabupaten Minahasa Tenggara. J Community Emerg. 2019;7(2):156-169.
15. Suryantara AAB. Faktor-Faktor Yang Mempengaruhi Kepatuhan Minum Obat Antihipertensi Pada Pasien Hipertensi Di Puskesmas Mengwi I .2022. Available from: https://repository.itekesbali.ac.id
16. Choudhry NK, Kronish IM, Vongpatanasin W, Ferdinand KC, Pavlik VN, Egan BM, et al. Medication Adherence And Blood Pressure Control: A Scientific Statement From The American Heart Association. Hypertension. 2022;79(1):E1-E14. doi:10.1161/HYP.0000000000000203.
17. Jhaj R, Gour P, Kumari S, Sharma S. Association Between Medication Adherence And Blood Pressure Control In Urban Hypertensive Patients In Central India. Int J Noncommun Dis. 2018;3(1):9. doi:10.4103/jncd.jncd_29_16.
18. Amalia VN, Sjarqiah U. Gambaran Karakteristik Hipertensi Pada Pasien Lansia di Rumah Sakit Islam Jakarta Sukapura tahun 2020. Muhammadiyah J Geriatr. 2023;3(2):62-68. doi:10.24853/mujg.3.2.62-68.
19. Muttaqin A. Buku Ajar Asuhan Keperawatan Klien Dengan Gangguan Sistem Kardiovaskular Dan Hematologi. Jakarta: Salemba Medika; 2012.
20. Coylewright M, Reckelhoff JF, Ouyang P. Menopause And Hypertension: An Age-Old Debate. Hypertension. 2008;51(4):952-959. doi:10.1161/HYPERTENSIONAHA.107.105742.
21. Akbar F, Syamsidar, Widya N. Karakteristik Lanjut Usia Dengan Hipertensi Di Desa Banua Baru. Bina Generasi J Kesehat. 2020;11(2):6-8. doi:10.35907/bgjk.v11i2.141.
22. Baringbing EP. Pengaruh Karakteristik Pendidikan Dengan Kejadian Hipertensi Pada Pasien Rawat Jalan di RSUD dr. Doris Sylvanus Provinsi Kalimantan Tengah. J Surya Medika. 2023;9(3):124-130. doi:10.33084/jsm.v9i3.6492.
23. Yu S, Guo X, Li GX, Yang H, Zheng L, Sun Y. Low Educational Status Correlates With A High Incidence Of Mortality Among Hypertensive Subjects From Northeast Rural China. Front Public Health. 2022;10. doi:10.3389/fpubh.2022.951930.
24. Sun K, Lin D, Li M, Mu Y, Zhao J, Liu C, et al. Association Of Education Levels With The Risk Of Hypertension And Hypertension Control: A Nationwide Cohort Study In Chinese Adults. J Epidemiol Community Health. 2022;76(5):451-457. doi:10.1136/jech-2021-217006.

25. Bafadal U, Wulandari AS, Kusumawardani N. Hubungan Pengawas Minum Obat Dengan Kepatuhan Peserta Prolanis Hipertensi di Puskesmas Bambanglipuro. Yogyakarta: Universitas Alma Ata; 2024. Available from: https://reposister.almaata.ac.id
26. Tarigan TKD, Silaen H. Pengaruh Edukasi Pengawas Minum Obat Antihipertensi Terhadap Kepatuhan Minum Obat Hipertensi Pada Pasien di Posbindu Kelurahan Galang Kota. BEST J Biol Educ Sci Technol. 2025;8(1):548-554.
27. Hidayah N, Tasalim R, Rahman S. Pengaruh Pemberian Pill Card Pengawas Minum Obat Terhadap Kepatuhan Minum Obat Pada Lansia Dengan Hipertensi. J Health Res Sci. 2024;4(2):344-354.
28. Kannure M, Hegde A, Khungar-Pathni A, Sharma B, Scuteri A, Neupane D, et al. Phone Calls For Improving Blood Pressure Control Among Hypertensive Patients Attending Private Medical Practitioners In India: Findings From Mumbai Hypertension Project. J Clin Hypertens. 2021;23(4):730-737. doi:10.1111/jch.14221.
29. Arshed M, Mahmud A, Minhat HS, Lim PY, Zakar R. Effectiveness Of A Multifaceted Mobile Health Intervention In Medication Adherence And Treatment Outcomes Among Patients With Hypertension In A Low- To Middle-Income Country: Randomized Controlled Trial. JMIR Mhealth Uhealth. 2024;12:1-20. doi:10.2196/50248.
30. Mirniam AA, Habibi Z, Khosravi A, Sadeghi M, Eghbali-Babadi M. A Clinical Trial On The Effect Of A Multifaceted Intervention On Blood Pressure Control And Medication Adherence In Patients With Uncontrolled Hypertension. ARYA Atheroscler. 2019;15(6):267-274. doi:10.22122/arya.v15i6.1904.
31. Sari WA, Rosidawati I, Brahmantia B, Muttaqin Z. Hubungan Tingkat Pengetahuan Tentang Hipertensi Dengan Upaya Pengendalian Tekanan Darah Pada Penderita Hipertensi Di Wilayah Kerja UPTD Puskesmas Mangkubumi. Tasikmalaya Nurs J. 2023;1(1):39-48.
32. Al Rasyid NH, Febriani N, Nurdin OFT, Putri SA, Dewi SC, Paramita S. Tingkat Kepatuhan Minum Obat Pasien Hipertensi Di Puskesmas Lempake. J Kedokteran Mulawarman. 2022;9(2):55-63.
33. Fahriah K, Rizal A, Irianty H. Hubungan Tingkat Pendidikan, Pengetahuan Dan Sikap Terhadap Pencegahan Penyakit Hipertensi Pada Usia Produktif Di Wilayah Kerja Puskesmas Melati Kuala Kapuas tahun 2021. Unsika. 2021;63:1-8.
34. Ayu NDF, Erwin T, Pemila U. Pengaruh Edukasi Diet DASH Terhadap Tekanan Darah Pada Penderita Hipertensi Di Wilayah Kerja Puskesmas Rumbia Kecamatan Rumbia Kabupaten Lampung Tengah tahun 2024. Qistina J Multidisiplin Indonesia. 2024;3(2):1142-1155.
35. Damayanti R, Sabar S, Lestari A, Nurarifah N, Sukmawati S. Pengaruh Pemberian Edukasi Terhadap Perubahan Tekanan Darah Pada Lansia Dengan Hipertensi. Lentora Nurs J. 2022;2(2):64-69. doi:10.33860/lnj.v2i2.1337.
36. Solon M, Putri OL, Naing PM. Pengaruh Edukasi Dengan Pendekatan Teori Model Behavioral System Dorothy E Johnson Terhadap Penurunan Tekanan Darah Pada Pasien Hipertensi di Puskesmas Jongaya Kecamatan Tamalate Kota Makassar. J Mitra Sehat. 2018;8(1):110-117. doi:10.51171/jms.v8i1.367.