JNK

JURNAL NERS DAN KEBIDANAN
(JOURNAL OF NERS AND MIDWIFERY)
http://ojs.phb.ac.id/index.php/jnk

Medication and Lifestyle Modification Adherence to Blood Pressure Control Among Hypertensive Patients: A Cross-Sectional Study

[CA]Abdul Qodir, Dwi Soelistyoningsih, Wira Daramtasia
[1]STIKes Widyagama Husada Malang, Indonesia
[CA]Corresponding Author

Article Information

History Article:
Received, 02/08/2024
Accepted, 03/12/2025
Published, 20/12/2025

Keyword:
Adherence to Medication, Lifestyle Modification, Blood Pressure

Abstract

Adherence to medication is a crucial aspect in blood pressure control, which in turn leads to a reduction in the incidence of cardiovascular disease and medical costs. The aim of the study was to determine medication and lifestyle modifications adherence to blood pressure control among hypertensive patients in a public health center. The method of the study used a cross-sectional involving participants with primary hypertension at the Community Health Centre. One hundred respondents were recruited through consecutive sampling methods. Hypertensive patients aged 40 to 74 years who has been taking antihypertensive drugs for at least two months were approved, while hypertensive patients with cormobid and patients with communicative or behavioral impairments were excluded. The instruments used was the TAQPH, which consists of six factors: medication, diet, stimulus, weight control, physical exercise, and stress management. Blood pressure measurements were conducted using a mercury sphygmomanometer. The data was examined with the chi-squared statistical test. Twenty-five (75%) of the patients who demonstrated high levels of adherence had controlled blood pressure. In contrast, 24 (75.0%) patients with medium adherence and 29 (82.9%) patients with low adherence demonstrated uncontrolled blood pressure. A significant correlation was observed between the level of therapy adherence and blood pressure in hypertensive patients (p = 0.001). Patients with low to moderate levels of adherence have uncontrolled blood pressure, whereas those with high levels of adherence have controlled blood pressure.

✉Correspondence Address:
STIKes Widyagama Husada Malang – East Java, Indonesia
Email: abdulqodir@widyagamahusada.ac.id
P-ISSN : 2355-052X
E-ISSN : 2548-3811
DOI: https://doi.org/10.26699/jnk.v12i3.ART.p221-229

INTRODUCTION

Adherence to therapy is essential for controlling blood pressure, which leads to decreased morbidity and mortality (Adisa et al., 2018). Antihypertensive medication and lifestyle modification treatment have been demonstrated in clinical studies to adjust the incidence of stroke and acute myocardial infarction by 43% and 15%, respectively. (Kang et al., 2015). Although antihypertensive drugs and lifestyle modifications are effective in controlling blood pressure and lowering the risk of complications, there is a concern regarding compliance with such therapies. Inadequate adherence can potentially lead to adverse medical, psychosocial, and quality-of-life outcomes, as well as an increased financial burden on healthcare systems (Peacock & Krousel-Wood, 2017; Asgedom et al., 2018).

Hypertension is a global health concern, with significant financial implications for the control of blood pressure (Pan et al., 2019). It is a substantial risk factor for cardiovascular disease, notably cerebral vascular accidents and myocardial infarction, and contributes to increase cases of mortality, morbidity, and disability. The incidence of hypertension affects 40 percent of the world's population. This number continues to rise, and it is estimated that by 2025, 1.5 billion people will suffer from hypertension (Amaral et al., 2015). The prevalence of hypertension varies considerably between countries. In Indonesia, according to the National Health Indicators Survey (2018), the incidence rate of hypertension was 34.11%, while in East Java, it was 36.32% among individuals aged 18 and over (Depkes RI, 2018)

A combination of antihypertensive medication therapy and lifestyle modifications can considerably regulate blood pressure and reduce the risk of complications. Individuals with hypertension must constantly monitor their blood pressure and follow their prescribed drug regimen. Adopting a healthy lifestyle that includes a balanced diet, frequent exercise, and stress management skills can also help manage hypertension. Individuals can mitigate their susceptibility to severe complications, including kidney damage, stroke, and heart disease, by adopting proactive measures to regulate their blood pressure. In order to effectively manage hypertension and enhance overall health outcomes, healthcare providers must educate patients on the significance of medication adherence and lifestyle modifications (Erin C. Dowd, Michael J. Frank, Anne Collins, James M. Goldd, and Deanna M. Barch & Kuschner, 2017).

The prevalence of adherence to hypertension therapy varies between approximately 50% and 70%. Research results in Beijing, China, were 43.5%, in Ethiopia, only 29.7%, and in Nigeria, more than 50% (Pan et al., 2019; Teshome et al., 2017; Tibebu & Mengistu, 2017). In Indonesia, 54.4% of patients regularly take medication, 32.27% of patients do not regularly take medication, and 13.33% do not take anti-hypertensive medication (Depkes RI, 2018). Previous research indicated that medication compliance rates were in 20% (Liberty et al., 2018) and 36.59% (Pramana et al., 2019), while lifestyle modification compliance was 28.6% (Qodir, 2020).

The issue of adherence to therapies, especially in the context of chronic diseases, has become a significant global concern. Failure to comply with medication and lifestyle changes might result in deteriorating health conditions and higher healthcare expenses. Hence, it is imperative for healthcare providers to tackle this matter by means of patient education, assistance, and consistent surveillance. Enhancing adherence rates can enable persons with chronic conditions to effectively manage their condition and enhance their overall quality of life. Promoting adherence to medicines is essential for tackling the increasing burden of chronic diseases globally (Taylor et al., 2019). Compliance issues frequently occur in individuals with hypertension undergoing antihypertensive drug therapy (Vrijens et al., 2017). It has been established that adherence to medication is significantly correlated with reduced blood pressure and a decreased risk of cardiovascular diseases, including hypertension, myocardial infarction, and stroke. Nevertheless, It is imperative to identify patients who are at high risk of non-adherence to

achieve the intervention target, enhance adherence levels, and regulate blood pressure.

Although a number of studies have been conducted in various countries investigating the compliance of patients with hypertension therapy, such studies are still relatively rare in Indonesia. This study is therefore of significant value as it provides the initial data required to inform the development of strategies to improve compliance and control blood pressure, thereby reducing the incidence of complications associated with hypertensive disease. The aim of this study is to determine the correlation between hypertension therapy adherence and blood pressure in hypertensive individuals.

METHODS

This cross-sectional study included participants with primary hypertension at the Public Health Center (PHC), Malang District, East Java, Indonesia. The inclusion criteria were as follows: hypertensive patients receiving single or combined antihypertensive drugs; antihypertensive drug therapy for at least 2 months prior to data collection of the study; patients aged 40–74 years old. The exclusion criteria were as follows: hypertensive patients with comorbidities such as chronic kidney disease, heart failure, and diabetes mellitus; pregnant women; and patients with communication or mental disorders.

The variables that are measured include those that characterize the respondents, such as age, gender, and educational level. The independent variables are as follows: Adherence to antihypertensive drug therapy and lifestyle modification represents patient compliance with hypertension therapy, which encompasses both pharmacological and non-pharmacological therapy over the past two months. The dependent variable is blood pressure, which is determined three times each respondent using a mercury sphygmomanometer.

An overall number of 100 respondents were recruited using the consecutive sampling method. The instruments employed in this study comprised questionnaires that included questions regarding respondent characteristics, such as gender, age, and educational level. The instruments used to measure adherence to anti-hypertensive drug therapy and lifestyle modification were the Treatment Adherence Questionnaire for Patients with Hypertension (TAQPH), which has been widely used in various countries.

The TAQPH questionnaire consists of 28 questions divided into 6 factors (F1-Medication: 9 questions, F2-Diet: 9 questions, F3-Stimulus: 3 questions, F4-weight control: 2 questions, F5-physical exercise: 2 questions, F6-stress management: 3 questions) and using Likert scale options (1: never, 2: sometimes, 3: often, 4: always), the higher the score, the higher the adherence. The level of adherence is divided into three categories: high (98–112), medium (70–97), and low (28–69). The validity and reliability test results showed a Cronbach coefficient of 0.862 and a retest reliability coefficient of 0.958 (Esquivel Garzón & Díaz Heredia, 2019).

Blood pressure was measured using a standardised method. Prior to measurement, respondents were instructed to rest for five minutes. Blood pressure measurements were repeated three times, and the average was sought as data to be analysed. Blood pressure measurements were conducted using a mercury sphygmomanometer. The results of blood pressure measurements were categorised into two groups: controlled managed (systolic and diastolic blood pressure less than 140 mmHg and 90 mmHg, respectively) and uncontrolled (systolic and diastolic blood pressure greater than 139 mmHg and 89 mmHg, respectively).

The data was analyzed using SPSS software with a bivariate chi-square test to examine the relationship between variables (gender, age, and education level) and hypertension therapy adherence. This was done in order to identify any associations between these variables and therapy adherence. In addition, the correlation between hypertension therapy adherence and blood pressure was analyzed in order to gain further insight into the factors influencing therapy adherence. The study was reviewed and approved by the Ethics

Committee of the Chakra Brahmanda Lentera Institution (Approval No. 008.1/026/I/EC/KEP/LCBL/2024).

RESULTS

Table 1. Characteristics of Respondents

Characteristics		f	%
Sex	Female	56	56%
	Male	44	44%
Age	Elderly	60	60%
	adult	40	40%
Education level	High	14	14%
	Low	86	86%
Adherence level	High	33	33%
	Medium	32	32%
	Low	35	35%
Blood pressure	Controlled	39	39%
	Uncontrolled	61	61%

Table 1 describes the findings of the study based on characteristics of participants which include gender, age, level of education, therapy adherence, and blood pressure. The investigation found that 56% of participants were female, with 44% being male. Age was divided into two categories: adults (60%) and the elderly (40%). The respondents' education level was divided into two categories: high (14%) and low (86%). In this study, adherence to therapy was classified into three levels: high, moderate, and low. The findings showed that 33% of the respondents were highly compliant, 32% were moderately compliant, and 35% were lowly compliant. The results of blood pressure measurements revealed that 39% of people had controlled blood pressure and 61% had uncontrolled blood pressure.

The findings demonstrated that 23 (41.1%) women and 16 (36.4%) men had controlled blood pressure, whereas 33 (58.9%) women and 28 (63.6%) men had uncontrolled blood pressure. The chi-square test yielded a p-value of 0.632 (>0.05), indicating that gender did not have a statistically significant association with blood pressure in hypertensive patients. The results of the analysis of respondent characteristics with blood pressure are presented in Table 2.

Table 2. Respondent Characteristics: Gender, Age, Education Level and Blood Pressure

Variabel		Blood Pressure		
		Controlled	Uncontrolled	p-value
Sex	Female	23 (41,1%)	33 (58,9%)	0,632
	Male	16 (36,4%)	28 (63,6%)	
Age	Elderly	25 (41,7%)	35 (58,3%)	0,503
	Adult	14 (35,0%)	26 (65,5%)	
Education level	High	4 (28,6%)	10 (71,4%)	0,388
	Low	35 (40,7%)	51 (59,3%)	
Total		39 (39,0%)	61 (61,0%)	

The results of the analysis of age variables and blood pressure showed that 25 (41.7%) adults and 14 (35.0%) elderly individuals had controlled blood pressure, while 35 (58.3%) adults and 26 (65.5%) elderly individuals had uncontrolled blood pressure. The chi-square test yielded a p-value of 0.503 (>0.05), indicating that there is no significant correlation between age and blood pressure in hypertensive individuals.

The analysis of respondents' education levels and blood pressure revealed that 4 (28.6%) respondents who had a high level of education and 35 (40.7%) respondents with a low level of education had controlled blood pressure, while 10 (71.4%) respondents having a high level of education and 51 (59.3%) respondents having a low level of education had uncontrolled blood pressure. The chi-square test analysis revealed a p-value of 0.388 (>0.05), demonstrating that there is not a significant correlation both education levels and blood pressure in hypertensive individuals.

Table 3. The Correlation between Hypertension Therapy Adherence and Blood Pressure in Hypertensive Patients

Variable		Blood Pressure		p-value
		controlled	uncontrolled	
Adherence to pharmacological and lifestyle modification therapies	high (98-112)	25 (75,1%)	8 (24,2%)	0,001
	medium (70-97)	8 (25,0%)	24 (75,0%)	
	low (28-69)	6 (17,1%)	29 (82,9%)	
Total		39(39.0 %)	61 (61,0%)	

Table 3 presents the findings of a study on pharmaceutical therapy adherence and lifestyle modifications in relation to blood pressure. Data analysis revealed that hypertensive patients with controlled blood pressure demonstrated high levels of adherence, with 25 (75.1%) individuals showing high adherence, 8 (25.0%) showing moderate adherence, and 6 (17.1%) showing low adherence. In contrast, hypertensive individuals with uncontrolled blood pressure showed varying levels of adherence: high (8 people, 24.2%), moderate (24 people, 75.0%), and low (29 people, 82.9%). The investigation into the correlation between adherence to hypertension treatment and blood pressure indicated a statistically significant relationship (p = 0.001). These findings highlight the correlation of hypertension adherence to treatment and blood pressure control among hypertensive patients.

DISCUSSION

The purpose of this study was to investigate the correlation between adherence to lifestyle modification and antihypertensive medication therapy with blood pressure in hypertensive patients. Additionally, we examined respondent variables, such as gender, age, and level of education. Our study examined the correlation between gender and blood pressure. We found that the adherence rate among women to hypertension treatment is higher than men (56% vs. 44%). Additionally, women exhibited better blood pressure control than men (41.1% vs. 36.4%). These findings align with prior research conducted in Pekanbaru, which similarly observed higher blood pressure control among women (53.7 vs. 38.8 for men) (Mitra & Wulandari 2019). Women are presumed to have greater control over their blood pressure because they are more conscious of hypertension and adhere to therapy (Rahman et al., 2017). Women are more likely to comply with hypertension therapy, and they also contain estrogen hormones, which might alter blood pressure regulation.

In this study found that hypertension prevalence was higher among adults compared to the elderly. However, it is necessary to keep in mind that our sample was not randomly selected which could emphasize the proportion of adult and elderly patients included. According to findings from *Framingham Heart Study*, the prevalence of

Hypertension rose from 27.3% among individuals under 60 years old to 74.0% among those over 80 years old (Alhawassi et al., 2015). We observed that adults with hypertension generally had better blood pressure management than the elderly. These study findings are consistent with previous studies that Blood pressure is more effectively controlled at age 62 than at age 63 and above (Mitra & Wulandari, 2019).

We found that patients with lower levels of education exhibited better blood pressure control. However, no significant correlation was identified between educational attainment and blood pressure. Previous research indicated that higher educational attainment is associated with improved blood pressure control, ranging from 59.4% to 61.5% (Kapoor et al., 2021; Mitra & Wulandari, 2019). Higher educational also correlates with increased likelihood of receiving blood pressure checkups and awareness of hypertension (Chowdhury et al., 2016). These findings suggests that targeted educational interventions could potentially enhance hypertension management among individuals with lower levels of education. In addition, the study also found that individuals with lower levels of education were less inclined to have frequent blood pressure screenings and had a lower level of awareness regarding their hypertension status. Thus, the implementation of instructional programs specifically customized for this group has the potential to close the gap in hypertension control and eventually enhance health outcomes (Omboni & Ferrari, 2015).

Our study discovered that 61.0% of the participants with hypertension were having uncontrolled blood pressure. Adherence to medication and lifestyle modifications was substantially correlated to controlled blood pressure. A previous study using 2,228 African-American participants defined uncontrolled blood pressure as systolic and diastolic blood pressure over 139 mmHg and 89 mmHg, respectively (Butler et al. 2017). Their findings showed that a greater higher prevalence of uncontrolled blood pressure and elevated clinic BP were associated with 24-hour non-adherence. Nonadherence to antihypertensive medication and modification of lifestyle have been associated with an increased risk of stroke and cardiovascular complications. (Shankari et al., 2020). A recent investigation indicated that during a median follow-through of 5.8 years, individuals with high adherence had a considerably lower risk of cardiovascular events than those with poor or moderate adherence (Yang et al., 2017). The study highlights the considerable influence that adhering to medication can have on the overall health outcomes of patients with hypertension (Edward et al., 2021). Healthcare professionals should maintain a focus on patient education and support to encourage compliance with antihypertensive treatment and lifestyle changes, thereby enhancing long-term cardiovascular health.

Our findings align with the prior investigation, where 52.6% of the elderly population had poorly managed blood pressure. Poor adherence to antihypertensive drugs, smoking cessation, and salt restriction were related to high blood pressure (Mitra & Wulandari, 2019). Another study from sub-Saharan Africa, involving 2,198 patients, reported on adherence and uncontrolled hypertension. Inadequate adherence to prescribed medication and salt restrictions has been shown to significantly contribute to the poor management of blood pressure (Macquart de Terline et al., 2020). We suggest that both adherence to medication and lifestyle modification are crucial for managing blood pressure effectively.

The findings of this study emphasize the significance of adherence to hypertension therapy in its impact on blood pressure. Pharmacological therapy adherence involves taking antihypertensive medication as prescribed by a doctor, whereas lifestyle modification adherence includes reduction in body weight engaging in the Dietary Approaches to Stop Hypertension (DASH) eating plan, restricting dietary sodium intake, enhancing physical activity, and abstaining from alcohol (Piña et al., 2020). In light of the findings of the study, it is recommended that public health centers implement measures to enhance adherence to blood pressure management protocols, with the aim of

reducing the morbidity, mobility, and complications associated with hypertension.

The strength of this study was the reliable measurement of blood pressure using established procedures and calibrated tools. Additionally, the TAQPH was a valid and reliable questionnaire consisting of 28 items on medication and lifestyle modification adherence. However, the study had certain limitations. The design, in particular, prevented us from determining a causality. Furthermore, this study did not collect data on some important variables, such as the types of antihypertensive medications.

CONCLUSION

In conclusion, the analysis revealed that factors such as gender, age, and education level were not significantly associated with blood pressure. The level of adherence to hypertension therapy remains low, with only approximately half of hypertensive patients demonstrating high adherence. These findings align with prior research, which demonstrated a correlation between high levels of adherence to medications and modifications to lifestyle and regulated blood pressure in hypertensive patients.

SUGGESTION

It is recommended that interventions to enhance adherence to medication therapy and lifestyle modifications to control blood pressure, especially in hypertensive patients, may reduce the incidence of cardiovascular disease, including hypertension, myocardial infarction, and stroke. Further research is required to identify the underlying mechanisms influencing blood pressure in hypertensive patients.

ACKNOWLEDGEMENT

The authors would like to acknowledge STIKES WIDYAGAMA HUSADA for their assistance in conducting this study. In addition, we would like to thank all of the research participants who took part in this study.

FUNDING

The funding for this study was provided by STIKES Widyagama Husada. No other external sources of funding or sponsorships were involved.

CONFLICTS OF INTEREST

The authors declared that they had no personal or financial conflicts of interest.

AUTHOR CONTRIBUTIONS

Abdul Qodir designed the empirical study and collected the data. Dwi Soelistyoningsih and Wira Daramatasia performed the statistical analyses, while all authors contributed to the development of the manuscript, including its final writing, revisions, and approval before its submission for publication.

REFERENCES

Adisa, R., Ilesanmi, O. A., & Fakeye, T. O. (2018). Treatment adherence and blood pressure outcome among hypertensive out-patients in two tertiary hospitals in Sokoto, Northwestern Nigeria. *BMC Cardiovascular Disorders*, *18*(1), 1–10. https://doi.org/10.1186/s12872-018-0934-x

Alhawassi, T. M., Krass, I., & Pont, L. G. (2015). Hypertension in Older Persons: A Systematic Review of National and International Treatment Guidelines. *Journal of Clinical Hypertension*, *17*(6), 486–492. https://doi.org/10.1111/jch.12536

Amaral, O., Chaves, C., Duarte, J., Coutinho, E., Nelas, P., & Preto, O. (2015). Treatment Adherence in Hypertensive Patients – A Cross-sectional Study. *Procedia - Social and Behavioral Sciences*, *171*, 1288–1295. https://doi.org/10.1016/j.sbspro.2015.01.243

Asgedom, S. W., Atey, T. M., & Desse, T. A. (2018). Antihypertensive medication adherence and associated factors among adult hypertensive patients at Jimma University Specialized Hospital, southwest Ethiopia. *BMC Research Notes*, *11*(1), 1–8. https://doi.org/10.1186/s13104-018-3139-6

Butler, M. J., Tanner, R. M., Muntner, P., Shimbo, D., Bress, A. P., Shallcross, A. J., Sims, M., Ogedegbe, G., & Spruill, T. M. (2017). Adherence to antihypertensive medications and associations with blood pressure among African Americans with hypertension in the Jackson Heart Study. *Journal of the American Society of Hypertension*, *11*(9), 581-588.e5. https://doi.org/10.1016/j.jash.2017.06.011

Chowdhury, M. A. B., Uddin, M. J., Haque, M. R., & Ibrahimou, B. (2016). Hypertension among adults in Bangladesh: Evidence from a national cross-sectional survey. *BMC Cardiovascular Disorders*, *16*(1), 1–10. https://doi.org/10.1186/s12872-016-0197-3

Depkes RI. (2018). Laporan Riskesdas 2018 Nasional.pdf. In *Lembaga Penerbit Balitbangkes* (p. 156).

Edward, A., Campbell, B., Manase, F., & Appel, L. J. (2021). Patient and healthcare provider perspectives on adherence with antihypertensive medications: an exploratory qualitative study in Tanzania. *BMC Health Services Research*, *21*(1), 1–12. https://doi.org/10.1186/s12913-021-06858-7

Erin C. Dowd, Michael J. Frank, Anne Collins, James M. Goldd, and Deanna M. Barch, & Kuschner. (2017). SPRINT: Intensive vs SBP COntrol and CVD Outcomes in Adults Aged 75+. *Physiology & Behavior*, *176*(3), 139–148. https://doi.org/10.1001/jama.2016.7050.Intensive

Esquivel Garzón, N., & Díaz Heredia, L. P. (2019). Validity and Reliability of the Treatment Adherence Questionnaire for Patients with Hypertension. *Investigacion y Educacion En Enfermeria*, *37*(3). https://doi.org/10.17533/udea.iee.v37n3e09

Kang, C. D., Tsang, P. P. M., Li, W. T. L., Wang, H. H. X., Liu, K. Q. L., Griffiths, S. M., & Wong, M. C. S. (2015). Determinants of medication adherence and blood pressure control among hypertensive patients in Hong Kong: A cross-sectional study. *International Journal of Cardiology*, *182*(C), 250–257. https://doi.org/10.1016/j.ijcard.2014.12.064

Kapoor, M., Dhar, M., Mirza, A., Saxena, V., & Pathania, M. (2021). Factors responsible for Uncontrolled Hypertension in the Adults over 50 years of age : A pilot study from Northern India. *Indian Heart Journal*, *73*(5), 644–646. https://doi.org/10.1016/j.ihj.2021.07.003

Liberty, I. A., Pariyana, P., Roflin, E., & Waris, L. (2018). Determinan Kepatuhan Berobat Pasien Hipertensi Pada Fasilitas Kesehatan Tingkat I. *Jurnal Penelitian Dan Pengembangan Pelayanan Kesehatan*, *1*(1), 58–65. https://doi.org/10.22435/jpppk.v1i1.428

Macquart de Terline, D., Kramoh, K. E., Bara Diop, I., Nhavoto, C., Balde, D. M., Ferreira, B., Houenassi, M. D., Hounsou, D., Ikama, M. S., Kane, A., Kimbally-Kaki, S. G., Kingue, S., Koffi, F., Kouam Kouam, C., Limbole, E., Mfeukeu Kuate, L., Mipinda, J. B., N'goran, Y., Sesso, Z., … Antignac, M. (2020). Poor adherence to medication and salt restriction as a barrier to reaching blood pressure control in patients with hypertension: Cross-sectional study from 12 sub-Saharan countries. *Archives of Cardiovascular Diseases*, *113*(6–7), 433–442. https://doi.org/10.1016/j.acvd.2019.11.009

Mitra, M., & Wulandari, W. (2019). Factors affecting uncontrolled blood pressure among elderly hypertensive patients in Pekanbaru City, Indonesia. *Open Access Macedonian Journal of Medical Sciences*, *7*(7), 1209–1213. https://doi.org/10.3889/oamjms.2019.255

Omboni, S., & Ferrari, R. (2015). The Role of Telemedicine in Hypertension Management: Focus on Blood Pressure Telemonitoring. *Current Hypertension Reports*, *17*(4), 1–13. https://doi.org/10.1007/s11906-015-0535-3

Pan, J., Wu, L., Wang, H., Lei, T., Hu, B., Xue, X., & Li, Q. (2019). Determinants of hypertension treatment adherence among a Chinese population using the therapeutic adherence scale for hypertensive patients. *Medicine*

(United States), *98*(27), e16116. https://doi.org/10.1097/MD.0000000000016116

Peacock, E., & Krousel-Wood, M. (2017). Adherence to Antihypertensive Therapy. *Medical Clinics of North America*, *101*(1), 229–245. https://doi.org/10.1016/j.mcna.2016.08.005

Piña, I. L., Di Palo, K. E., Brown, M. T., Choudhry, N. K., Cvengros, J., Whalen, D., Whitsel, L. P., & Johnson, J. (2020). Medication adherence: Importance, issues and policy: A policy statement from the American Heart Association. *Progress in Cardiovascular Diseases*. https://doi.org/10.1016/j.pcad.2020.08.003

Pramana, galih adi, Setia, R., & Saputri, D. N. E. (2019). Faktor-faktor yang Mempengaruhi Kepatuhan Minum Obat Pasien Hipertensi Peserta Prolanis di Puskesmas Pringapus Kabupaten Semarang. *Indonesian Journal of Pharmacy and Natural Product*, *02*(01), 19–24. https://doi.org/10.35473/ijpnp.v2i1.196

Qodir, A. (2020). Analisis Faktor Determinan yang berhubungan dengan Kepatuhan Rekomendasi Modifikasi Gaya Hidup Pasien Hipertensi. *Jurnal Ners Dan Kebidanan (Journal of Ners and Midwifery)*, *7*(2), 256–263. https://doi.org/10.26699/jnk.v7i2.art.p256-263

Rahman, M., Williams, G., & Al Mamun, A. (2017). Gender differences in hypertension awareness, antihypertensive use and blood pressure control in Bangladeshi adults: findings from a national cross-sectional survey. *Journal of Health, Population, and Nutrition*, *36*(1), 23. https://doi.org/10.1186/s41043-017-0101-5

Shankari, G., Ng, S. C., Goh, S. Y., Woon, F. P., Doshi, K., Wong, P. S., Fan, Q., Tan, I. F., Narasimhalu, K., & De Silva, D. A. (2020). Modifiable Factors Associated with Non-Adherence to Secondary Ischaemic Stroke Prevention Strategies. *Journal of Stroke and Cerebrovascular Diseases*, *29*(12), 105395. https://doi.org/10.1016/j.jstrokecerebrovasdis.2020.105395

Taylor, M. K., Sullivan, D. K., Ellerbeck, E. F., Gajewski, B. J., & Gibbs, H. D. (2019). Nutrition literacy predicts adherence to healthy/unhealthy diet patterns in adults with a nutrition-related chronic condition. *Public Health Nutrition*, *22*(12), 2157–2169. https://doi.org/10.1017/S1368980019001289

Teshome, D. F., Bekele, K. B., Habitu, Y. A., & Gelagay, A. A. (2017). Medication adherence and its associated factors among hypertensive patients attending the Debre Tabor General Hospital, Northwest Ethiopia. *Integrated Blood Pressure Control*, *10*, 1–7. https://doi.org/10.2147/IBPC.S128914

Tibebu, A., & Mengistu, D. (2017). *Adherence to recommended lifestyle modifications and factors associated for hypertensive patients attending chronic follow-up units of selected public hospitals in Addis Ababa , Ethiopia*. 323–330. https://doi.org/10.2147/PPA.S126382

Vrijens, B., Antoniou, S., Burnier, M., & Sierra, A. De. (2017). *Current Situation of Medication Adherence in Hypertension*. *8*(March), 1–8. https://doi.org/10.3389/fphar.2017.00100

Yang, Q., Chang, A., Ritchey, M. D., & Loustalot, F. (2017). Antihypertensive Medication Adherence and Risk of Cardiovascular Disease Among Older Adults: A Population-Based Cohort Study. *Journal of the American Heart Association*, *6*(6). https://doi.org/10.1161/JAHA.117.006056