

Original Research

The relationship between level of knowledge and adherence therapy in hypertensive patients at Ramadhan Pharmacy in Yogyakarta City

Ryan Ardiansyah^{1,a}, Ginanjar Zukhruf Saputri^{1,b*} , Woro Supadmi^{1,c}, Susan Fitria Candradewi^{1,d}, Dwi Hastuti², Menit Ardhiyani³

¹Program Studi S1 Pharmacy/Faculty of Pharmacy, Universitas Ahmad Dahlan, Jl. Kapas 9, Semaki, Umbulharjo, Yogyakarta 55166, Indonesia

²Program Studi D3 Pharmacy, Akademi Farmasi Indonesia, Jl. Bintaran Tengah No. 14, Yogyakarta 55161 Yogyakarta No. 14, Indonesia

³Apotek Ramadhan Yogyakarta, Indonesia

 ginanjar.zukhruf@pharm.uad.ac.id

Submitted: September 19, 2023

Revised: October 31, 2023

Accepted: November 29, 2023

Abstract

The prevalence of hypertension in Indonesia is still high. Several factors, including knowledge and compliance influence the outcome of hypertension therapy. Management of hypertension based on medication adherence is absolutely necessary with the aim of achieving and maintaining blood pressure below 140/90 mmHg. This study aimed to determine the relationship between the level of knowledge and compliance of hypertensive patients at Ramadhan Pharmacy. This study used an analytical observational research method with a cross-sectional approach. Purposive sampling techniques are used to collect data from 78 patients. Data was collected during the period July-August 2022. Respondents were hypertensive patients who met the inclusion criteria, who had been taking antihypertensive drugs for one month and were willing to fill in informed consent. Data collection using validated questionnaire tools, in the form of level of knowledge and adherence to antihypertensive drug therapy (MARS). Data results were analyzed using test statistical analysis Fisher Exact SPSS to determine if there is a relationship between knowledge and compliance. Based on the Fisher Exact Test, respondents had a high level of knowledge, and 73% and 77% of hypertensive patients were obedient to antihypertensive drugs, respectively. The relationship of knowledge level with adherence to antihypertensive drugs p-value = 0.017 (OR=4,000.95%; CI (1.305- 12.256). The conclusion of this study shows the relationship between knowledge and adherence therapy in hypertensive patients at Ramadhan Pharmacy Yogyakarta. Therefore, the role of pharmacist education is one of the efforts to improve pharmaceutical services for hypertensive patients in improving adherence and success of therapy.

Keywords: compliance; hypertension; knowledge; MARS

1. Introduction

Hypertension is a silent killer because it can cause fatal diseases such as stroke and heart attack. Even so, this disease can be prevented and controlled. Hypertension is dangerous because it is related to the cardiovascular system, which provides and circulates nutrients and oxygen to tissues and organs in the human body (Nurrahmani & Kurniadi, 2015). Based on PERHI, in 2023 it was reported that hypertension is one of the causes of CKD after DM. Hypertension reportedly results in the death of about 8 million people annually. A total of 1.5 million are reported in Southeast Asia (Lydia et al., 2023).

The Ministry of Health (Riskesdas, 2018) found that the total number of people with hypertension in Indonesia increased by 34.1% compared to 2013 of 25.8%. Based on PERHI data, 2023 shows that in 2021, hypertension is the largest cause of CKD, which is 39% (Lydia et al., 2023). Yogyakarta's total number of hypertension cases is 11.0%, higher than the national figure of 8.8%. This makes the province

of Yogyakarta Special Region (DIY) in 4th position in terms of high blood pressure in all regions in Indonesia. High blood pressure is included in the top 10 diseases and the top cause of death rate in recent years. Through the Integrated Disease Surveillance (STP) system of Puskesmas, 78,468 cases of hypertension were recorded. In comparison, hospitals' Integrated Surveillance of diseases (STP) amounted to 15,388 cases of Essential hypertension (Dinkes D, 2020).

Management of hypertension includes pharmacological and non-drug treatment. Blood pressure can be controlled with antihypertensive drugs. At the same time, non-drug treatment makes lifestyle changes such as not smoking, not drinking alcohol, setting a diet or balanced nutrition so that body weight becomes ideal, and psychological aspects such as stress management, exercise, and rest (Katzung & Betram, 2007).

The level of patient compliance in taking drugs such as hypertension has an impact on improving the quality of life of patients (Taylor D, 2010). Based on the 2023 PERHI consensus, one of the policies in controlling hypertension is on antihypertensive choice factors and adherence to antihypertensive therapy (Lydia et al., 2023). Good adherence to drug consumption can improve disease control (Erdine S, 2010). Hypertensive patients require regular treatment for a long time, so medication adherence is one of the important factors for controlling blood pressure. (Swastini et al., 2016).

In addition to adherence to taking drugs, the level of knowledge is also a success factor for hypertension. The knowledge a person has can determine how to behave in carrying out therapy and maintaining his health (Pramestutie, 2016). People with hypertension need to understand what hypertension is, the symptoms of hypertension, the importance of treatment, taking the medication regularly, and the risks that occur if you do not take medication (Pramestutie, 2016). Non-compliance of hypertensive patients in carrying out a healthy lifestyle and non-adherence to drug use therapy can be caused by low knowledge and communication factors with health workers (Heisler et al., 2010). The results of a study from Sihombing and Artini's (2017) research showed that respondents with good hypertension knowledge did not comply with the treatment. Similar studies are needed to see the relationship between the two variables, knowledge, and adherence to antihypertensive therapy. Hypertension is a chronic disease, and its treatment is offered through referral programs (PRB) by first-level health facilities. Pharmacies collaborate with BPJS Kesehatan (Ministry of Health, 2014), one of which is Ramadhan Pharmacy Yogyakarta. Based on the explanation above, the researcher wanted to know the relationship between knowledge and adherence to taking drugs in hypertensive patients who visited the health service of Ramadhan Pharmacy Yogyakarta.

2. Research Methods

This study is an analytical observational with a cross-sectional approach with Purposive Sampling techniques through interviews and using knowledge questionnaires and MARS therapy adherence that have previously been carried out validation and reliability tests ($r > 0.235$). Data collection was carried out at the Ramadhan Pharmacy during the January- March 2022 period. Of the total 80 hypertensive patients, 78 were recruited, consented to informed consent, and met the inclusion criteria. The inclusion criteria in this study were male or female patients aged 18-65 years with a diagnosis of hypertension and who had taken antihypertensive drugs for at least one month. The exclusion criteria in this study were hypertensive patients with pregnancy and incomplete questionnaire filling. Data was collected through patient interviews, using hypertension knowledge questionnaires and antihypertensive drug consumption compliance questionnaires (MARS) that validated validation tests. The validation test results of the hypertension knowledge questionnaire showed a value of $r > 0.235$ (Amalia, 2022), and the MARS compliance questionnaire showed valid and reliable results (Cronbach alpha 0.578) (Sholawat, 2019). Data analysis used SPSS with a descriptive univariate test describing patient demographics and

bivariate chi-square analysis (fisher exact test) to see the relationship between knowledge level and adherence to patient antihypertensive consumption.

3. Results and Discussion

The results of the analysis of the demographic characteristics of patients are presented in Table 1 below. The characteristics of patient respondents in this study are seen from gender, age, education, occupation, number of hypertension drugs, duration of hypertension, hypertension drug class and financing.

The results of Table 1 analysis show that 60% of the majority of respondents are women, with the majority age range at the age of ≥ 60 years (73%). Most patients have a high school-college education (82%), and 76% of respondents are employed. A total of 60% of patients use 1 type of antihypertensive and have a history of hypertension of more than 5 years (58%).

The results of the age distribution of respondents at the Ramadhan Pharmacy showed the largest frequency of hypertensive patients aged ≥ 60 years. In line with Lestari's research (2015), in people with high blood pressure, most of the Indonesian population is aged >60 years. Increasing age causes physiological and functional changes, increasing susceptibility to diseases, including hypertension (Calvalho et al., 2012).

The gender of the majority of respondents at Ramadhan Pharmacy Yogyakarta is female 47 (60%) respondents. In line with the research of Wahyuni et al. (2021), most respondents at Anwar Medika Hospital are generally women (62.8%). Dewi Anggriani (2019) conducted research in the Kampa Health Center area on 70 respondents with hypertension (78%) who were female. Women experience an increase in blood pressure after menopause. Women are at risk of having higher blood pressure than before menopause. Hormonal changes cause salt sensitivity and weight gain in women, both of which can lead to high blood pressure (Nurhayati, 2012).

Education level Most respondents have more than 9 years of education 64 (82%) respondents, while education is less than the same as 9 years 14 respondents (18%). In line with research by Hilda et al. (2021), the respondents' education level is in the high category. However, they still experience high blood pressure problems because respondents know the risk factors for hypertension, especially about maintaining a healthy lifestyle and avoiding high-sodium foods such as salted fish and high-cholesterol foods such as fried foods. However, some respondents do not live this healthy lifestyle, so they still have Hypertension.

Table 1. Characteristics of Hypertensive Patient Respondents at Ramadhan Pharmacy Yogyakarta

Variable	Number of Respondents (n=78)	Percentage (100%)
Gender		
Man	31	40
Woman	47	60
Age		
≥ 60 Years	57	73
< 60 Years	21	27
Education		
> 9 Years (SMA-PT)	64	82
≤ 9 Years (Elementary-Junior High)	14	18
Work		
Work	19	76
Not Working	59	24
Number of Hypertension Drugs		
1	47	60
>1	31	40

Variable	Number of Respondents (n=78)	Percentage (100%)
Duration of hypertension		
≥ 5 Years	45	58
< 5 Years	53	42
Drug Class		
Single		
ACEI	2	3
ARB	18	23
CCB	25	32
Diuretic	2	3
Combination		
ACEI+CCB	3	4
ARB+CCB	19	24
ARB+Diuretics	3	4
BB+CCB	3	4
CCB+Diuretic	2	3
ARB+BB+CCB	1	1
Financing		
BPJS	78	100
Common	-	-

The picture of the use of antihypertensive drugs shows that the majority of patients receive a single antihypertensive therapy with antihypertensive drug classes in the form of ARB and CCB. This is by hypertension management guidelines (Ministry of Health, 2011).

3.1. Knowledge level of Hypertension

Knowledge of hypertensive patients can be divided into (2) high and medium categories. The high knowledge level category is seen from a knowledge score greater than or equal to or exceeding the average overall score of all respondents (score ≥ 57), and medium knowledge level if the score is lower than the average overall score of all respondents (score < 57).

Based on Table II. Knowledge level of 78 respondents, a total of 57 respondents (73%) have high category knowledge, and 21 respondents (27%) have medium knowledge. Based on these results, it can be concluded that the level of hypertension knowledge of respondents at Ramadhan Pharmacy Yogyakarta has a high hypertension knowledge category.

Table 2. Category of Knowledge Level of Hypertensive Patients at Ramadhan Pharmacy Yogyakarta July-August 2022

Knowledge	Frequency (n=78)	Percentage (%)
Tall	57	73
Keep	21	27

3.2. Adherence Rate of Antihypertensive Therapy

In this study, the MARS questionnaire. MARS is a measuring instrument used to assess adherence to drug use by patients using a certain scale (Molloy et al., 2012). Each statement on the MARS questionnaire has a rating scale of 1-5. The level of therapeutic adherence of patients in taking antihypertensive drugs is judged by the available answers such as always, often, sometimes, rarely, never. Grades 1 (always) through 5 (never) for 5-25. The advantage of using the MARS method is that data collection is more practical, cheaper, and efficient.

Adherence to the MARS questionnaire is divided into two categories: the non-compliance category for a score below 25 and the compliance category for a maximum score of 25. Table III shows the distribution of the level of adherence to hypertension therapy respondents at Ramadhan Pharmacy Yogyakarta can be known. Adherence using the MARS questionnaire from 78 respondents, as many as 60 (77%) were compliant, and 18 (23%) were non-compliant in antihypertensive treatment. Based on these results, it can be concluded that respondents' compliance at Ramadhan Pharmacy Yogyakarta is in the compliance category.

Table 3. Therapy Adherence of Hypertensive Responders at Ramadhan Pharmacy Yogyakarta 2022

Compliance	Score	Number of n=78	Percentage
Obedient	25	60	77%
Disobedient	<25	18	23%

3.3. Relationship of Knowledge Level and Adherence Rate of Antihypertensive Therapy

This analysis was conducted to see if there was a relationship between knowledge and therapy adherence in hypertensive patients at Ramadhan Pharmacy Yogyakarta. The respondents' knowledge level in data analysis is categorized as high and medium, while the level of compliance is categorized as compliant and non-compliant. The data in this study did not meet the Chi-Square test because one cell had an Expected count value below 5 or more than 20%. If so, the alternative test used is the Fisher Exact Test. Table IV. shows the results of data analysis of the relationship between knowledge and therapy adherence in hypertensive patients at Ramadhan Pharmacy Yogyakarta.

Table 4. The Relationship of Knowledge and Therapy Adherence in Hypertensive Patients at Ramadhan Pharmacy Yogyakarta 2022

		Compliance		OR	P Value
		Obedient	Disobedient		
Knowledge	Tall	48(84%)	9(16%)	4	0,017*
	Keep	12(57%)	9(43%)		

Fisher Test

It is known that 48 respondents have high knowledge and adherence to therapy, 12 respondents have moderate knowledge and adherence to therapy, nine respondents have high knowledge and do not comply with therapy, and nine respondents have moderate knowledge and do not comply with therapy. The results of statistical analysis with the Fisher Exact Test obtained a significance value of 0.017 ($P < 0.05$). It can be concluded that there is a relationship between knowledge and therapy adherence in hypertensive patients at Ramadhan Pharmacy Yogyakarta. Furthermore, get a 4x Odds Ratio, meaning that "high" knowledge has a 4x chance of adhering to the therapy.

In the study of Rasajati et al. (2015), Factors Related to Treatment in Hypertensive Patients Kedungmundu Health Center Semarang showed that the results of the chi-square test were statistically related between the level of knowledge of hypertension and the level of compliance with the value of $p = 0.000$ ($p < 0.05$). Respondents with high-category hypertension knowledge tend to be more compliant with treatment compared to low category knowledge because respondents with high-category knowledge have a better understanding of hypertension treatment and the dangers of hypertension if they do not check blood pressure regularly, so they are more obedient to take medication and doctor's recommendations to take medication regularly.

This is in line with research (Pratiwi & Perwitasari, 2017). There is a relationship between hypertension knowledge and patient compliance in carrying out treatment (P -value = 0.000). In his research, knowledge results from someone perceiving something through their senses. Better

knowledge about hypertension and awareness of health treatment services is improving. Strengthened by the research of Puspita et al. (2017) in their research, it was concluded that the knowledge of hypertensive patients could be a good provision in hypertension management so that this knowledge can affect the adherence to treatment of hypertensive patients. Patients with high knowledge tend to be more compliant in carrying out treatment than those with low knowledge. Anggraini Dewi's 2019 research showed a relationship between hypertension knowledge and therapy compliance with a value of $p = 0.014$. Similar studies have also shown a relationship between hypertension knowledge and adherence to amlodipine drug therapy in patients at the Arjuno Health Center, Malang (Haldi Taufik, 2021). Based on the results of this study, it was concluded that knowledge related to hypertension is related to adherence to antihypertensive therapy in patients. Therefore, education is needed as an effort to increase patient knowledge. Thus, therapy compliance will be achieved, and blood pressure control will be better (Anggraini, Dwi, 2019).

4. Conclusion

Based on the results of this study, it can be concluded that there is a relationship between hypertension knowledge and drug consumption compliance in hypertensive patients visiting Ramadhan Pharmacy Yogyakarta with a P-value significance value of 0.017 ($P < 0.05$). Providing pharmacy education can be done as an effort to increase patient knowledge. Thus, adherence to therapy will be achieved, blood pressure control will be better, and patients' quality of life will improve.

Acknowledgments

We want to thank all hypertension respondents who have participated in this study, all staff of Ramadhan Pharmacy for their opportunity to collect data for this study, and Afina Pharmacy as collaborators in preliminary trials in the implementation of this study.

References

- Amalia, D.I., 2022, Pengaruh Mobile Hypertension App Terhadap Tingkat Pengetahuan Pasien Hipertensi Di Puskesmas Area Kota Yogyakarta, *Skripsi*, Fakultas Farmasi Universitas Ahmad Dahlan, Yogyakarta
- Anggara, F. H., & Prayitno, N. (2012). Faktor-Faktor yang Berhubungan dengan Kejadian Tekanan Darah di Puskesmas Telaga Murni, Cikarang Barat. *Jurnal Ilmiah Kesehatan*, 20-25.
- Anggraini Dewi, Nia A, dan Oktari M, Hubungan Pengetahuan Penderita Hipertensi Tentang Hipertensi Dengan Kepatuhan Minum Obat Antihipertensi Di Wilayah Kerja Puskesmas Kampa Tahun 2019, *Jurnal NERS* vol 3, no 2, Oktober 2019
- Annisa., 2013, Penilaian Kualitas Hidup pada Usia Lanjut Dengan Eq-5d di Klun Jantung Sehat Kelurahan Pondok Kelapa dan Faktor-Faktor yang Mempengaruhi, Tesis, Fakultas Kedokteran Universitas Indonesia, Jakarta.
- Carvalho, M.V.D., Siqueira, L.B., Sousa, A.L.L., Jardim, P.C.B.V., 2012, The Influence of Hypertension on Quality of Life, *Arq Bras Cardiol*, 100(2): 164- 17.
- Chan, L., Chen, C.H., Hwang, J.J., Yeh, S.J., Shyu, K.G., Lin, R.T., Li, Y.H., Liu, L.Z., Li, J.Z., Shau, W.Y., Weng, T.C., 2016. Cost-effectiveness of Amlodipine Compared with Valsartan in Preventing Stroke and Myocardial Infarction Among Hypertensive Patients in Taiwan. *Int J of Gen Med*, Vol. 9, p. 175-182.
- Dahlan, Sopiudin, 2014. Statistik Untuk Kedokteran Dan Kesehatan Edisi 6. Jakarta, Salmba Medika.
- Dinas Kesehatan DIY. Profil Kesehatan Provinsi DIY Tahun 2020.

- Emiliana, N., Fauziah, M., Hasanah, I., Fadlilah, D.R., 2021. Analisis Kepatuhan Kontrol Berobat Pasien Hipertensi Rawat Jalan pada Pengunjung Puskesmas Pisangan Tahun 2019. *Jurnal Kajian dan Pengembangan Kesehatan Masyarakat*, 1 : 224–232.
- Erdine S. Compliance With the Treatment of Hypertension: *The Potential of Combination Therapy. The Journal Of Clinical Hypertension* 2010;(12)
- Haldi Taufik, Liza P, dan Ika R. Hubungan Pengetahuan Dan Sikap Pasien Hipertensi Terhadap Kepatuhan Penggunaan Obat Amlodipin Di Puskesmas Arjuno Kota Malang, *Jurnal Farmasi Komunitas* Vol. 8, No. 1, (2021) 27-31
- Heisler, M., Hofer, T.P., Klamelurus, M.L.,Schmittiel, J., Selby, J., Hogan, M.M.,dkk., 2010.*Study protocol:the Adherence and intensification of Medications (AIM) STUDY-A CLUSTER RANDOMIZED CONTROLLED Effectiveness study.* *Trials*,11:95.
- Katzung, G & Bertram, M.2007. *Basic and Clinical Pharmacology*, 10 th Ed. USA:The McGraw-Hill Company.
- Kemendes RI. Hipertensi. Infodatin Pusat Data dan Informasi Kementerian kesehatan RI. 2014; (Hipertensi):1-7.
- Kementerian kesehatan RI., 2011 . *Modull penggunaan obat*: KemenKes.
- Lydia, Aida, Amanda T, Anandhara I, Anasthaasia S, Antonia A, Arieska A,et al. 2023. Panduan Promotiv dan Preventif Hipertensi. Perhimpunan Dokter Hipertensi Indonesia.Jakarta,
- Molloy, G. J., O'Carroll, R. E., & Ferguson, E., (2014). Conscientiousness and medication adherence: A meta-analysis. *Annals of Behavioural Medicine*, pp. 47, 92–101. doi:10.1007/s12160-013-9524-4
- Notoatmodjo, S., 2014, *Promosi Kesehatan dan Perilaku Kesehatan*, 40, Rineka Cipta, Jakarta.
- Nurrahmani Ulfah dan Helmanu Kurniadi., 2015. *Stop Diabetes Hipertensi Kolesterol Tinggi Jantung Koroner*. Yogyakarta: Istana Media.
- Peacock E, Krousel-Wood M., (2017). Adherence to Antihypertensive Therapy. *Medical Clinics of North America*, pp. 101, 229–45.
- Pramestutie,Hananditia R. dan Silviana,Nina., 2016.Tingkat Pengetahuan Pasien Hipertensi tentang Penggunaan Obat di Puskesmas Obat di Puskesmas Kota Malang. *Jurnal Farmasi Klinik Indonesia*.5(1);26-34.
- Pratiwi, R. I., dan Perwitasari, M., 2017. AnalisisFaktor-Faktor Yang Mempengaruhi Kepatuhan Pasien Hipertensi Dalam Penggunaan Obat Di RSUD Kardinah. Seminar Nasional IPTEK Terapan (SENIT) 2017. PoliteknikHarapanBersama, Tegal.
- Puspita, E., Oktaviarini, E., & Santik, Y. D. P., 2017. Peran Keluarga dan Petugas Kesehatan dalam Kepatuhan Pengobatan Penderita Hipertensi di Puskesmas Gungpati Kota Semarang. *Jurnal Kesehatan Masyarakat Indonesia*, 12(2), 25–32. <https://jurnal.unimus.ac.id/index.php/jkmi/article/download/3172/3056>
- Rasajati QP, Raharjo BB. Ningrum D., (2015). Faktor-Faktor Yang Berhubungan Dengan Kepatuhan Pengobatan Pada Penderita Hipertensi Di Wilayah Kerja Puskesmas Kedungmudu Kota Semarang. Semarang: FIK Universitas Negeri Semarang. *Unnes Journal of Public Health*. UJPH.
- Riskesdas. 2018.*Badan Penelitian dan Pengembangan Kesehatan*,Departemen Kesehatan,Jakarta : Republik Indonesia.
- Sihombing T.F.H. dan Artini, I.G.A., 2017. Tingkat Pengetahuan Mengenai Hipertensi dan Pola Kepatuhan Pengobatan pada Pasien Hipertensi yang Berkunjung ke Tenda Tensi Tim Bantuan Medis Janar Duta Fakultas Kedokteran Universitas Usdayana. *E-Jurnal Medika*.4(12): 164-169.
- Susilo, Y & Wulandari, A., 2011. *Cara Jitu Mengatasi Hipertensi*. Yogyakarta: Graha Ilmu.

- Swastini D.A, Putri S.A, Rudiarta N.M, Wiryanhini I.A.D., 2016. Gambaran Terapi Layanan JKN Pada Pasien Hipertensi Stage 1 Dan Diabetes Melitus Tipe 2 Di Unit Rawat Jalan Rumah Sakit Udayana. *Jurnal Farmasi Udayana*. 1(5):33-39.
- Taylor D. Newbould J. (2010). *Evaluation of the Scale, Causes and Costs of Waste Medicines*. YHEC/School of pharmacy, University of london.