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The Association Between Knowledge of Hypertension and Compliance with Antihypertensive Medication on Prospective Hajj Pilgrims

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Abstract

Background: Indonesia is the most significant contributor to Hajj pilgrims, with health risks that are still relatively high, one of which is Hypertension. Lack of knowledge about Hypertension is an obstacle to controlling Hypertension. In addition, half of hypertension-related deaths could be prevented by compliance with taking antihypertensive medication. **Objective:** This study sought to determine the association between prospective Hajj pilgrims' compliance with medication and their knowledge of hypertension in 2023 who suffer from Hypertension in Batu City. **Method:** The research used quantitative methods with a cross-sectional design. The sample for this research was 39 *Prospective Hajj pilgrims*, and total sampling was taken. **Result:** The results of the study on *Prospective Hajj pilgrims* who suffer from Hypertension in Batu City showed that the majority of their knowledge about Hypertension was in a good category, 23 people (59.0%), the level of compliance with taking medication was in the low sort 24 people (61.5%); There was no correlation between medication adherence and knowledge of hypertension (p-value 0.185). **Conclusion:** Non-compliance with taking medication prospective Hajj pilgrims in Batu City can be changed by regularly providing education about the importance of taking medication and the risks that can arise if they do not regularly take hypertension medication.

Keywords: prospective hajj pilgrims, hypertension knowledge, compliance with taking medication

Original Research Article

INTRODUCTION

Hypertension (HT) or high blood pressure is a significant health problem because the incidence of this disease is high throughout the world. Approximately 7.5 million deaths worldwide are caused by hypertension, and it accounts for almost 12.8% of all deaths. In 2025, the incidence of hypertension is predicted to increase to 1.56 billion adults (Mouhtadi et al., 2018; Singh et al., 2017). The leading cause of disability globally and a major risk factor for cardiovascular disease is hypertension (Carey et al., 2018). Hypertension is responsible for the occurrence of cerebrovascular disease by 62% and ischemic heart disease by 49%. It can be a significant cause of death due to coronary artery disease, stroke, kidney failure (Sadeq & Lafta, 2017)

Indonesia is the nation having the greatest number of Muslims worldwide. Hajj pilgrims from Indonesia are the most significant contributors each year at around 10% and have a relatively high health risk, which puts Hajj pilgrims at risk of receiving treatment and dying while performing the Hajj (Darmareja et al., 2023; Puriatarza & Kamso, 2019). The proportion of Hajj pilgrims with a high risk is around 30-45%, and the majority are elderly, more than 50 (Puriatarza & Kamso, 2019; Wahjudi & Putriana, 2014). Diseases with the highest risk are hypertension and diabetes mellitus at 25-37% (Wahjudi & Putriana, 2014). In Saudi Arabia, 45% of Hajj pilgrim deaths are caused by hypertension, 22.89%, and diabetes mellitus, 13.25% (Huda et al., 2022). From the research results, from 105,988 data collected, 13,757 (13.02%) and 6,623 (6.2%) Hajj pilgrims were categorized as having grade one and two hypertension (Utami & Ardiana, 2021). In Indonesia, East Java is ranked first in the number of Hajj pilgrims who are classified as high risk aged >60 years, suffering from chronic diseases and certain illnesses (Wahjudi & Putriana, 2014). As Hajj pilgrims get old, Hajj pilgrims are more susceptible to disease, primarily degenerative diseases. In East Java Province, cardiovascular illness is the leading cause of mortality for pilgrims performing the Hajj (Handayani et al., 2016). According to the results of Riskesdas in 2013, data on hypertension sufferers in East Java was 26.4%; in 2018, it was 36.3%. The prevalence of hypertension has increased quite significantly (Dinas Kesehatan, 2021). 2018, hypertension was ranked first, with 10,110 cases in Batu City (BPS, 2019). To carry out the Hajj pilgrimage well, pilgrims must be physically and mentally healthy (Rustika et al., 2019). If health conditions are not optimal, the Hajj pilgrimage activities will not be optimal (D. Handayani et al., 2016). Prospective Hajj pilgrims who have hypertension must maintain their health and control their blood pressure so that it remains normal or not high.

Prospective Hajj pilgrims must also have good knowledge and understanding of hypertension. Patients with hypertension need to understand the fundamentals of the condition, such as its diagnosis, causes, and common symptoms (Wiryanto et al., 2021). Lack of knowledge about hypertension and its complications is an obstacle to controlling hypertension (Chimberengwa & Naidoo, 2019). In addition, several factors that influence patient recovery and successful treatment of hypertension are influenced by patient compliance in taking medication (D. W. Fauziah & Mulyani, 2022). Adherence to antihypertensive treatment could prevent nearly half of hypertension-related deaths (Chimberengwa & Naidoo, 2019). Compliance with taking medication is essential for hypertension sufferers because regular consumption of antihypertensive medication can help patients control their blood pressure ((Aliyah & Damayanti, 2022). Treatment of hypertension depends on the patient's level of understanding and perception of hypertension (Bacha & Abera, 2019).

A previous study showed that there was a relationship between knowledge related to hypertension and compliance with taking medication in hypertensive patients undergoing outpatient treatment at TK. II Udayana Hospital, Denpasar (Dhrik et al., 2023). Likewise, research conducted by (Ramadhani & Nasution, 2023) showed a relationship between knowledge about hypertension and compliance with hypertension medication in hypertensive patients at the Sirnajaya Health Center, Bekasi, West Java. The previous research mentioned above took samples in the form of outpatients suffering from hypertension but not prospective Hajj pilgrims, whereas in this study the target was prospective Hajj pilgrims. Research on prospective Hajj pilgrims regarding the relationship between their knowledge about hypertension and compliance with taking hypertension medication in the city of Batu has never been carried out. This data is important to achieve Istitha'ah for prospective Hajj pilgrims during the waiting period until leaving for Hajj and returning home to Indonesia. Besides that, the results of this research can help the health service and community health centers in Batu City create policies regarding educating prospective Hajj pilgrims. The purpose of this study is to ascertain the association knowledge about hypertension and compliance with taking medication among prospective Hajj pilgrims suffering from hypertension in Batu City in 2023.

MATERIALS AND METHODS

Cross-sectional, quantitative research methodology is used in this study. The total sample is 39 prospective Hajj pilgrims in 2023 who suffer from hypertension in Batu City—sampling with total sampling. Total sampling is a sampling technique where all population members are sampled. Total sampling is used if the population is less than 100 people (Sugiyono, 2022). The inclusion criteria for this research are prospective regular Hajj pilgrims in Batu City who will depart in 2023, prospective Hajj pilgrims who suffer from hypertension, and prospective Hajj pilgrims who receive hypertension therapy and are willing to be respondents. Exclusion criteria include prospective regular Hajj pilgrims who do not depart in 2023, do not suffer from hypertension, do not receive hypertension therapy, and are not willing to become respondents. Data collection was taken from May-June 2023 on prospective hajj pilgrims 2023 who suffered from hypertension who carried out the first stage of examination at five Community Health Centers in Batu City, including Junrejo, Beji, Batu, Bumiaji, Sisir Community Health Centers. The study was carried out in May and June of 2023. The ethical number for this research is No. 07/EC/KEPK-FKIK/2023.

Data was collected using a hypertension knowledge questionnaire comprising 25 questions about hypertension's definition, symptoms, complications, and management. The level of knowledge is divided into three categories, namely the excellent category if the percentage of respondents' answers is 76% - 100%, the sufficient category if the percentage of answers is 56% - 75%, the poor category if the percentage of respondents' answers is <56%. Medication adherence is measured by the MMAS-8 questionnaire, which consists of eight questions. The categorization of medication adherence is based on the final number of scores. A score of >7 is in the high compliance category, 6-7 is in the medium compliance category, and <6 is in the low compliance category. The point questions in the MMAS are whether the patient is compliant in taking medication when they are in good condition when they go out or stop taking medication when they feel inadequate, and how often the respondent forgets to take medication. Respondent characteristics, respondent knowledge about hypertension, and categories of adherence to taking HT medication are presented using univariate analysis to see the frequency distribution. The relationship between HT knowledge and medication adherence is presented using bivariate analysis, namely the Spearman rank test. In the Spearman test results, if the p-value is > 0.05, there is no relationship between the two variables studied. Research data analysis will be included in the Statistical Package for the Social Sciences (SPSS) software.

RESULT

Respondent Characteristics

The result of research on prospective Hajj Pilgrims in 2023 who suffer from hypertension in Batu City obtained data on the characteristics of respondents consisting of gender, age, education, and occupation, which are presented in Table 1.

Table 1. Distribution Characteristics of Respondent

Characteristics	n	%
Gender		
Male	11	28.2
Female	28	71.8
Age (years)		
40-49	2	5.1
50-59	7	17.9
60-69	20	51.3
>70	10	25.6
Level of Education		
Elementary School	14	35.9
Junior High School	4	10.3
Senior High School	5	12.8

Characteristics	n	%
Diploma	3	7.7
Bachelor	12	30.8
Masters	1	2.6
Doctoral	0	0
Occupation		
Not work	6	15,4
Housewife	14	35.9
Private	4	10.3
Civil Servants	4	10.3
Farmer	11	28.2

From Table 1, the results show that this research was dominated by 28 female respondents (prospective Hajj pilgrims) (71.8%), 20 respondents aged 60-69 years (51.3%), and 14 respondents with an elementary school education level (35.9%), 14 working as housewives (35.9%).

Level of Hypertension Knowledge among Prospective Hajj Pilgrims 2023 in Batu City

Prospective Hajj Pilgrims' knowledge about hypertension is categorized into three categories: poor, sufficient, and good. The results of knowledge about HT in prospective Hajj Pilgrims are shown in table 2 below:

Table 2. Distribution of Hypertension Knowledge Level among Prospective Hajj Pilgrims

Knowledge Level	n	%
Poor	3	7.7
Sufficient	13	33.3
Good	23	59.0
Total	39	100

According to the research findings, 23 respondents (59%) who are potential Hajj pilgrims in 2023 and suffer from hypertension in Batu City have a good understanding of hypertension.

Compliance with Medication Taking in Prospective Hajj pilgrims

Compliance with taking medication in this study was divided into three levels: low, medium, and high. The research results related to adherence to taking this medication are presented in Table 3.

Table 3. Distribution of Medication Compliance among prospective Hajj pilgrims

Level of Adherence to Taking Medication	n	%
Low	24	61.5
Medium	6	15.4
High	9	23.1
Total	39	100

Based on Table 3, from 39 prospective Hajj pilgrims, 24 respondents (61.5%) showed a low level of compliance with taking medication, while nine respondents (23.1%) had a high level of compliance.

Relationship between Hypertension Knowledge and Compliance with Medication

The link between prospective Hajj pilgrims' knowledge of and adherence to their hypertension medications was examined in this study using the Spearman rank test. The analysis is shown in table 4 below:

Table 4. Relationship hypertension knowledge and compliance with medication among Prospective Hajj pilgrims

Hypertension Knowledge	Medication Adherence			Total	P Value
	Low	Medium	High		
	n (%)	n (%)	n (%)	n (%)	
Sufficient	2 (5.13)	0 (0)	1 (2.56)	3 (7.69)	0.184
	0 (25.64)	2 (5.13)	1 (2.56)	13 (33.33)	
	2 (30.77)	4 (10.26)	7 (17.95)	23 (58.98)	
	4 (61.54)	6 (15.39)	9 (23.07)	39 (100)	

n: Frequency; %,: Percentage ; p value: significance level

The table indicates the respondents' distribution, with the majority having good knowledge and a low compliance level with hypertension medication, namely 12 respondents (30.77). The results of bivariate analysis using the Spearman rank test showed no relationship between knowledge about hypertension and compliance with taking medication in prospective Hajj pilgrims with a p-value of 0.184 (p value > 0.05).

DISCUSSION

Respondent Characteristics

The study's findings indicate that 28 respondents (71.80%) were women, making up the bulk of the sample. This research is by Hazwan & Pinatih (2017), which shows that out of 50 respondents, most Hypertension sufferers were female, 56%, and 44% were male. Hormonal fluctuations in women who have achieved menopause result in a drop in the ratio of estrogen to androgen. Moreover, elevated renin release may cause blood pressure to rise (Hazwan & Pinatih, 2017). However, because it shields the heart, the hormone estrogen benefits women who have not yet entered menopause (Riani & Putri, 2023). Apart from that, most women are at home more to manage the household and lack physical activity, so they are at risk of suffering from hypertension than men who spend most of their time outside the home working (Mayefis et al., 2022).

Most respondents who suffered from hypertension in this study were aged 60-69 years, as many as 20 people (51.3%), then aged >70 years, as many as 10 people (25.6%). This research is by Massa & Manafe (2021), namely that most hypertensive respondents are 60-69 years old (68.8%). Growing older is a factor that affects all cardiovascular risks, including rising blood pressure (Kionowati et al., 2018). The risk of developing hypertension increases by 2.18x in people aged 60-64 years, 2.45x in people aged 65-69 years, and 2.97 times in people aged > 70 years (Nurhidayati et al., 2018).

According to the study's findings, most potential pilgrims in Batu City who suffer from hypertension have an elementary school education, totaling 14 people (35.9%). Lifestyle factors influenced by education level include smoking, drinking habits, and physical activity, such as exercising (Nurmalita et al., 2019). The degree of education has a significant impact on hypertension. A lack of education can lead to a lack of health knowledge and awareness about how to live a healthy lifestyle (Pebrisiana et al., 2022). Respondents with low education have less extensive knowledge than respondents with high levels of education (Wahyudi et al., 2017).

Homemakers comprised the bulk of the study's responses of 14 people (35.9%). Research by Fauziah et al, (2019) found that 25 people (58.1%) of the respondents who suffered from hypertension worked as housewives. Compared with women who work, women who do not work or are only domestic workers suffer from hypertension more often. The activities carried out by homemakers mean they do not have time to exercise, increasing the risk of hypertension and obesity (Afifah et al., 2022). When homemakers do more housework, they need physical and mental preparation. Stress and heavy daily loads will increase blood pressure (Fajriati et al., 2023).

Level of Hypertension Knowledge among Prospective Hajj Pilgrims 2023 in Batu City

The majority of prospective Hajj Pilgrims in 2023 who suffer from hypertension in Batu City have good knowledge regarding hypertension. This aligns with research by Khairiah & Sipayung (2018), that 53 respondents (82.8%) out of 64 respondents had good knowledge about hypertension. Knowledge can be obtained through visual, audio, or audio-visual media. Knowledge can also be obtained through experience and learning processes, both formal and informal (Angkawijaya et al., 2016).

Knowledge is critical so that people can understand why they do something so that their behavior can more easily be directed towards the better (Fauziah & Mulyani, 2022). Someone with good knowledge will automatically behave following their knowledge (Tarigan et al., 2018). Lack of knowledge of older people with hypertension will lead to poor habits in terms of treating (Putri & Supartayana, 2020).

Compliance with Medication Taking in Prospective Hajj pilgrims

Most of the respondents' level of adherence to taking antihypertensive medication was in the low category. This non-compliance with taking hypertension medication may be due to most respondents having an elementary school education. According to research by Pujasari et al. (2015), with a low education level, as many as 56 people (66.7%) were non-compliant with hypertension treatment compared to high education level non-compliant as many as 14 people (31.8%).

Respondents' education will influence their adherence to hypertension medication. An individual's adherence to hypertension treatment increases with their level of education (Darwati et al., 2022). A person's low education can cause a lack of health knowledge and awareness about healthy living behavior (Pebrisiana et al., 2022).

The Association between Knowledge of Hypertension and Compliance with Antihypertensive Medication

Based on table 4, it was found that the majority of prospective Hajj Pilgrims who had good knowledge about hypertension had a low level of medication adherence 12 people (30.77%). Based on the Spearman rank test, a p-value of 0.185 ($p > 0.05$) was obtained; it means there is no association between hypertension knowledge and antihypertensive medication compliance among prospective hajj pilgrims. The research findings of Handayani et al. (2019) found that $P=0.550$ indicated no correlation between respondents' knowledge and their adherence to taking their medicine.

In this study, several factors might have caused no significant relationship between hypertension knowledge and medication compliance in prospective Hajj pilgrims. Even though most of the knowledge possessed by Prospective Hajj pilgrims in Batu City is good, it is not a guarantee that it will influence compliance with taking medication, maybe because most study participants were elderly. A study from Purnawan (2019) showed that the majority aged ≥ 60 years did not comply with taking medication, as many as 74 people (52.11%). Factors that cause older people to not comply with hypertension treatment are busy work, diminished memory for the right dosage and timing of medication delivery, the presence of drug side effects such as nausea, drowsiness, and dizziness while using the drug; treatment is stopped when their condition is good (Massa & Manafe, 2021). Older people's compliance with taking hypertension medication is a factor that determines whether blood pressure can be controlled (Massa & Manafe, 2021). Compared with the adult age group who are still physically strong, the elderly group who are not compliant with seeking treatment is also related to access to health services due to hilly geographical conditions making it difficult for them to go to health service centers (Tambuwun et al., 2021). In addition, many prospective hajj pilgrims do not live with their children or families, so there is no one to remind prospective hajj pilgrims to take their medication. Therefore, family support is very important in reminding elderly prospective hajj pilgrims when to take their medication. According to Fajriati et al. (2023), an environment such as health

workers and supportive families can encourage compliant behavior in taking medication. Family support is believed to have implications for a patient's compliance with taking antihypertensive drugs. Family acceptance and actions, namely all components of family support, have an impact that will have a significant influence on hypertension sufferers (Anjalina et al., 2024).

However, this finding contradicts the findings of Khairiah & Sipayung (2018), who found a relationship between respondents' knowledge and adherence to taking medication in hypertension patients. Someone who lacks knowledge has a 1.503x greater risk of not complying with antihypertensive medication than someone with good knowledge (Fauziah & Mulyani, 2022). Respondents with high knowledge mean they can understand the meaning, benefits, and purpose of regular hypertension treatment. This knowledge is obtained through formal education and their own experience (Handayani et al., 2019). Patient compliance with medication is influenced by good knowledge about Hypertension. A thorough understanding of hypertension lowers the chance of consequences, including kidney problems and coronary heart disease (Sahadewa et al., 2019).

The limitation of this study is the small number of respondents, which is 39 people. The small or limited number of respondents can affect the research results' external validity, so generalization of these findings to a wider population needs to be done carefully. Another limitation is that the factors influencing medication adherence were not studied.

CONCLUSION

This research found that most respondents' knowledge level in 2023 in Batu City was in the excellent category (59%), and compliance with taking medication was in the low category (61.5%). Other than that, there was no relationship between the respondents' compliance with taking their medicine and their knowledge about hypertension. Further researchers can include variables that influence medication adherence in a person and use a larger number of respondents or qualitative research methods to discover in depth why prospective Hajj pilgrims in 2023 in Batu City are not compliant with taking hypertension medication.

CONFLICT OF INTEREST

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REFERENCES

- Afifah, W. V., Pakki, I. B., & Asrianti, T. (2022). Analisis Faktor Risiko Kejadian Hipertensi Pada Lansia di Wilayah Kerja Puskesmas Rapak Mahang Kecamatan Tenggarong Kabupaten Kutai Kartanegara. *Wal'afiat Hospital Journal*, 3(1), 59–72.
- Aliyah, N., & Damayanti, R. (2022). Faktor-Faktor yang Berhubungan dengan Kepatuhan Minum Obat Pasien Hipertensi di Primary Health Care Negara Berkembang; Systematic Review. *Syntax Literate: Jurnal Ilmiah Indonesia*, 7(5), 5375–5396.
- Angkawijaya, A. A., Pangemanan, J. M., & Siagian, I. E. T. (2016). Hubungan Tingkat Pengetahuan Masyarakat dengan Tindakan Pencegahan Hipertensi di Desa Motoboi Kecil Kecamatan Kotamobagu Selatan. *Jurnal Kedokteran Komunitas dan Tropik*, 4(1), 73–77.
- Anjalina, A. P., Suyanto, & Noor, M. A. (2024). Hubungan Dukungan Keluarga dengan Kepatuhan Konsumsi Minum Obat Anti Hipertensi. *Jurnal Keperawatan Berbudaya Sehat*, 2(1), 40–44. <http://jurnal.unw.ac.id/index.php/JKBS>

- Bacha, D., & Abera, H. (2019). Knowledge, Attitude and Self-Care Practice towards Control of Hypertension among Hypertensive Patients on Follow-up at St. Paul's Hospital, Addis Ababa. *Ethiopian Journal of Health Sciences*, 29(4), 421–430. <https://doi.org/10.4314/ejhs.v29i4.2>
- BPS. (2019). *Badan Pusat Statistik (BPS) Batu*. <https://Batukota.Bps.Go.Id/>.
- Carey, R. M., Muntner, P., Bosworth, H. B., & Whelton, P. K. (2018). Prevention and Control of Hypertension: JACC Health Promotion Series. In *Journal of the American College of Cardiology* (Vol. 72, Issue 11, pp. 1278–1293). Elsevier USA. <https://doi.org/10.1016/j.jacc.2018.07.008>
- Chimberengwa, P. T., & Naidoo, M. (2019). Knowledge, Attitudes and Practices Related to Hypertension among Residents of A Disadvantaged Rural Community in Southern Zimbabwe. *PLoS ONE*, 14(6), 1–16. <https://doi.org/10.1371/journal.pone.0215500>
- Darmareja, R., Fitriani, G. N., Asmarany, N., Tanjung, N. F., & Cahyani, I. (2023). Perspektif Kesehatan Matra Dalam Manajemen Penyakit Tidak Menular Pada Jemaah Haji: Tinjauan Literatur. *Jurnal Keperawatan*, 15(2), 629–642. [Http://Journal.Stikeskendal.Ac.Id/Index.Php/Keperawatan](http://Journal.Stikeskendal.Ac.Id/Index.Php/Keperawatan)
- Darwati, L. E., Setianingsih, & Asiyah, S. N. (2022). Karakteristik, Kepatuhan Minum Obat dan Gambaran Tekanan Darah Penderita Hipertensi. *Jurnal Fisioterapi Dan Ilmu Kesehatan Sisthana*, 4(2), 67–74.
- Dhrik, M., Prasetya, A. A. N. P. R., & Ratnasari, P. M. D. (2023). Analisis Hubungan Pengetahuan terkait Hipertensi dengan Kepatuhan Minum Obat dan Kontrol Tekanan Darah pada Pasien Hipertensi. *Jurnal Ilmiah Medicamento*, 9(1), 70–77. <https://doi.org/10.36733/medicamento.v9i1.5470>
- Dinas Kesehatan. (2021). *Profil Kesehatan Provinsi Jawa Timur Tahun 2020*.
- Fajriati, N., Kurniawati, D., & Rahman, T. A. (2023). Hubungan Tingkat Pengetahuan dengan Kepatuhan Minum Obat Antihipertensi pada Pasien Program Rujuk Balik (PRB) di Puskesmas Kayu Tangi. *Journal Of Pharmaceutical Care And Sciences*, 3(2), 123–129. <https://Ejurnal.Unism.Ac.Id/Index.Php/Jpcs>
- Fauziah, D. W., & Mulyani, E. (2022). Hubungan Pengetahuan Terhadap Tingkat Kepatuhan Minum Obat Anti Hipertensi. *Indonesian Journal of Pharmaceutical Education*, 2(2), 94–100. <https://doi.org/10.37311/ijpe.v2i2.15484>
- Fauziah, Y., Musdalipah, Rachmawati, & Dongge, S. H. (2019). Analisis Tingkat Kepatuhan Pasien Hipertensi dalam Minum Obat di RSUD Kota Kendari. *WARTA FARMASI*, 8(2), 63–70. <https://poltek-binahusada.e-journal.id/wartafarmasi>
- Handayani, D., Umbul, C., & Martini, S. (2016). Indeks Prediksi Risiko Kematian Jemaah Haji di Provinsi Jawa Timur. *Jurnal Wiyata*, 3(2), 133–139.
- Handayani, S., Nurhaini, R., & Aprilia, T. J. (2019). Faktor-Faktor yang Mempengaruhi Kepatuhan Pasien dalam Mengonsumsi Obat Antihipertensi di Puskesmas Jatinom. *CERATA Jurnal Ilmu Farmasi*, 10(2), 39–44.
- Hazwan, A., & Pinatih, G. (2017). Gambaran Karakteristik Penderita Hipertensi dan Tingkat Kepatuhan Minum Obat di Wilayah Kerja Puskesmas Kintamani I. *Intisari Sains Medis*, 8(2), 130–134. <https://Doi.Org/10.1556/IsM.V8i2.127>
- Huda, M., Bustan, M. N., & Gobel, F. A. (2022). Diabetes Melitus dan Hiperkolesterol sebagai Faktor Kematian Jemaah Haji Pada Embarkasi Sultan Hasanuddin Makassar. *Journal of Muslim Community Health (JMCH)*, 3(3), 155–161. <https://doi.org/10.52103/jmch.v3i3.997>
- Khairiah, R., & Sipayung, T. U. (2018). Hubungan Pengetahuan dan Sikap terhadap Kepatuhan Minum Obat pada Pasien Hipertensi. *Jurnal Antara Kebidanan*, 1(4), 197–206.
- Kionowati, Mediastini, E., & Septiyana, R. (2018). Hubungan Karakteristik Pasien Hipertensi terhadap Kepatuhan Minum Obat di Dokter Keluarga Kabupaten Kendal. *Jurnal Farmasetis*, 7(1), 6–11.
- Massa, K., & Manafe, L. A. (2021). Kepatuhan Minum Obat Hipertensi pada Lansia. *Sam Ratulangi Journal of Public Health*, 2(2), 46–52.

- Mayefis, D., Suhaera, & Sari, Y. S. (2022). Hubungan Karakteristik Pasien Hipertensi dengan Kepatuhan Minum Obat di UPT Puskesmas Meral Kabupaten Karimun Tahun 2020. *SEHATMAS: Jurnal Ilmiah Kesehatan Masyarakat*, 1(3), 266–278. <https://doi.org/10.55123/sehatmas.v1i3.460>
- Mouhtadi, B. B., Kanaan, R. M. N., Iskandarani, M., Rahal, M. K., & Halat, D. H. (2018). Prevalence, Awareness, Treatment, Control and Risk Factors Associated with Hypertension in Lebanese Adults: A Cross Sectional Study. *Global Cardiology Science and Practice*, 2018(1). <https://doi.org/10.21542/gcsp.2018.6>
- Nurhidayati, I., Aniswari, A. Y., Sulistyowati, A. D., & Sutaryono, S. (2018). Penderita Hipertensi Dewasa Lebih Patuh daripada Lansia dalam Minum Obat Penurun Tekanan Darah. *Jurnal Kesehatan Masyarakat Indonesia*, 13(2), 1–5.
- Nurmalita, V., Annisaa, E., Pramono, D., & Sunarsih, E. S. (2019). Hubungan Kepatuhan Minum Obat Antihipertensi terhadap Kualitas Hidup pada Pasien Hipertensi. *Jurnal Kedokteran Diponegoro*, 8(4), 1366–1374.
- Pebrisiana, Tambunan, L. N., & Baringbing, E. P. (2022). The Relationship of Characteristics with The Event of Hypertension in Outpatient Patients in RSUD dr. Doris Sylvanus Central Kalimantan Province. *Jurnal Surya Medika*, 8(3), 176–186. <https://doi.org/10.33084/jsm.vxix.xxx>
- Pujasari, A., Setyawan, H., & Udiyono, A. (2015). Faktor-Faktor Internal Ketidakpatuhan Pengobatan Hipertensi di Puskesmas Kedungmundu Kota Semarang. *Jurnal Kesehatan Masyarakat (E-Journal)*, 3(3), 99–108. <http://Ejournal-S1.Undip.Ac.Id/Index.Php/Jkm>
- Puriatarza, E., & Kamsu, S. (2019). Cause of Death of Indonesia Hajj in Armenia, Saudi Arabia 2015. *KnE Life Sciences*, 4(10), 115. <https://doi.org/10.18502/cls.v4i10.3776>
- Purnawan, I. N. (2019). Kepatuhan Berobat Penderita Hipertensi di Wilayah Kerja Puskesmas Payangan Kabupaten Gianyar. *Jurnal Kesehatan Terpadu*, 3(1), 15–21.
- Putri, D., & Supartayana, K. (2020). Hubungan Tingkat Pengetahuan Lansia tentang Hipertensi dengan Kepatuhan Diet Hipertensi di Panti Sosial Tresna Werdha Jara Mara Pati Buleleng. *Jurnal Medika Usada*, 3(2), 41–47.
- Ramadhani, A., & Nasution, L. S. (2023). Level of Knowledge of Hypertension Patients and Compliance with Treatment at Sirnajaya Health Center. *Muhammadiyah Medical Journal*, 4(2), 86. <https://doi.org/10.24853/mmj.4.2.86-94>
- Riani, D. A., & Putri, L. R. (2023). Gambaran Kepatuhan Minum Obat pada Pasien Hipertensi Dewasa di Puskesmas Kabupaten Sleman dan Kota Yogyakarta. *ARMADA: Jurnal Penelitian Multidisiplin*, 1(4), 310–320. <https://doi.org/10.55681/armada.v1i1.495>
- Rustika, Kusnali, A., Puspasari, H. W., Oemiyati, R., Ristini, Musadad, D. A., & Syam, P. (2019). Tingkat Pengetahuan, Sikap, dan Tindakan Jemaah Haji terkait Istithaah Kesehatan di Indonesia. *Buletin Penelitian Sistem Kesehatan*, 22(4), 245–254. <https://doi.org/10.22435/hsr.v22i4.2244>
- Sadeq, R., & Lafta, R. K. (2017). Knowledge, Attitude and Practice about Hypertension in Hypertensive Patients Attending Hospitals in Baghdad, Iraq. *South East Asia Journal of Public Health*, 7(1), 29–34. <https://doi.org/10.3329/seajph.v7i1.34676>
- Sahadewa, S., Novita, N., Dwipa, K., Yoga, G. A., & Pertiwi, M. D. (2019). Hubungan Pengetahuan terhadap Kepatuhan Minum Obat Anti Hipertensi pada Pasien Hipertensi Usia Lanjut di Puskesmas Krian Kabupaten Sidoarjo. *HTMJ (Hang Tuah Medical Journal)*, 17(1), 75–89. www.Journal-Medical.Hangtuah.Ac.Id
- Singh, S., Shankar, R., & Singh, G. P. (2017). Prevalence and Associated Risk Factors of Hypertension: A Cross-Sectional Study in Urban Varanasi. *International Journal of Hypertension*, 2017. <https://doi.org/10.1155/2017/5491838>
- Sugiyono. (2022). *Metode Penelitian Kuantitatif: Vol. Cetakan ke 3*. Alfabeta .
- Tambuwun, A. A., Kandou, G. D., & Nelwan, J. E. (2021). Hubungan Karakteristik Individu dengan Kepatuhan Berobat pada Penderita Hipertensi di Puskesmas Wori Kabupaten Minahasa Utara. *Jurnal KESMAS*, 10(4), 112–121.

- Tarigan, A., Lubis, Z., & Syarifah. (2018). Pengaruh Pengetahuan, Sikap dan Dukungan Keluarga terhadap Diet Hipertensi di Desa Hulu Kecamatan Pancur Batu Tahun 2016. *JURNAL KESEHATAN*, 11(1), 9–17. <https://doi.org/10.24252/jkesehatan.v11i1.5107>
- Utami, E., & Ardiana, M. (2021). Body Mass Index and Hypertension in Indonesian Hajj Pilgrims. *Journal of Hypertension*, 39(2). <http://journals.lww.com/jhypertension>
- Wahjudi, P., & Putriana, M. F. (2014). Karakteristik dan Status Kesehatan Jamaah Haji Kabupaten Banyuwangi Tahun 2012. *Jurnal IKESMA*, 10(1), 1–12.
- Wahyudi, C. T., Ratnawati, D., & Made, S. A. (2017). Pengaruh Demografi, Psikososial dan Lama Menderita Hipertensi Primer terhadap Kepatuhan Minum Obat Antihipertensi. *Jurnal JKFT: Universitas Muhammadiyah Tangerang*, 2, 14–28.
- Wiryanto, W., Nasution, E. S., Dalimunthe, A., & Rohani, A. S. (2021). Edukasi Hipertensi dan Pemeriksaan Tekanan Darah serta Kolesterol pada Masyarakat Kelurahan Jati Karya, Binjai sebagai Upaya Preventif Penyakit Komorbid Covid-19. *Unri Conference Series: Community Engagement*, 3, 457–463. <https://doi.org/10.31258/unricsce.3.457-463>