

ORIGINAL ARTICLE

Factors associated with the utilization of health services among patients with hypertension during the Covid-19 pandemic: a cross-sectional study in West Lombok Regency, Indonesia

Sri Masdiningsih Utami^{1,2}, I Ketut Swarjana¹, Ni Luh Adi Satriani¹, Ida Ayu Ningrat Pangruating Diyu¹

¹Master of Nursing Program, Faculty of Health, Institute of Technology and Health Bali, Bali, Indonesia

²Bachelor of Nursing Program, School of Health Sciences Mataram, West Nusa Tenggara, Indonesia

Corresponding Author: I Ketut Swarjana **Email:** ktswarjana@gmail.com

Received: 27 September 2021 **Revised:** 26 November 2021 **Accepted:** 18 December 2021 **Available online:** January 2022
DOI: 10.55131/jphd/2022/200204

ABSTRACT

The Covid-19 pandemic has had a wide impact on all areas of life, especially health. One of the serious impacts that need to be addressed is the utilization of health services among people with a history of co-morbidities, the most common of which is hypertension. The purpose of this study was to determine the factors associated with the utilization of health services among patients with hypertension during the Covid-19 pandemic in West Lombok Regency, Indonesia. This study used a cross-sectional study design involving 435 hypertensive patients, selected using cluster sampling. The research instrument was a questionnaire, and the data was analyzed using univariate (frequency and proportion), bivariate (Chi-square and Fisher's exact test), and multivariate analysis (multiple logistic regression). The majority of respondents (72.4%) utilized health services, and from the results of the multivariate analysis, the significant factors associated with the utilization were health status (Adj.OR: 0.25; $p < 0.001$); availability (Adj.OR: 6.79; $p < 0.001$); and acceptability (Adj.OR: 0.06; $p < 0.001$). Improving the utilization of health services among patients with hypertension is necessary, as is expanding access to hypertension health services through strengthening health centers, mobile health center services, community integrated services for non-communicable diseases, and home visits.

Key words:

Covid-19 pandemic; hypertension; utilization; health services; Indonesia

Citation:

S. M. Utami, I K. Swarjana, N.L.A. Satriani, I. A. N. P. Diyu. Factors associated with the utilization of health services among patients with hypertension during the Covid-19 pandemic: a cross-sectional study in West Lombok Regency, Indonesia. J Public Hlth Dev. 2022;20(2):43-54.(<https://doi.org/10.55131/jphd/2022/200113>)

INTRODUCTION

Hypertension is a serious medical problem, and a global health issue, that is a risk factor for several diseases, including heart attack, brain disease, and kidney disease. As such, hypertension is a cause of premature death worldwide. A total of 1.13 billion people in the world suffer from hypertension. The burden of hypertension is known to be disproportionate, with two-thirds of cases found in low- and middle-income countries.¹ In Indonesia, the prevalence of hypertension reached 25.8% in 2013, and increased to 34.1% in 2018.^{2,3} Meanwhile, the prevalence of hypertension in 2018 for those aged 18 years in West Nusa Tenggara Province was 27.80%, and one of the regencies with a high prevalence of hypertension was West Lombok, with a prevalence of 24.96%.⁴

Hypertension is a complex condition in which blood pressure is persistently above normal (systolic blood pressure ≥ 140 mmHg or diastolic blood pressure ≥ 90 mmHg).^{2,5} Chronic high blood pressure can cause complications. Therefore, hypertension needs to be detected early through regular blood pressure checks, so that people with hypertension can access health services.^{6,7} Access to health services is the right of every person, and the government has a responsibility to provide equitable access to the community.^{8,9} Access has five dimensions: affordability, availability, accessibility, accommodation, and acceptability.^{10,11}

During the current Covid-19 pandemic, access to health services is important, especially for people with a history of co-morbidities who have a serious risk of contracting and being hospitalized because of Covid-19. Hypertension is one of the most common co-morbidities that occur in patients with Covid-19, and many individuals who die as a result of Covid-19, have a history of hypertension.¹² In addition, if the patient does not have access to health services, they

are left without a way to control their blood pressure. Uncontrolled hypertension is a cause of global morbidity and mortality; therefore, controlled hypertension can reduce the morbidity and mortality of disease worldwide. Meanwhile, uncontrolled hypertension may increase the number of deaths caused by cardiovascular and cerebrovascular diseases.^{13,14}

Several findings among 20 countries show that the utilization of health services has decreased during the Covid-19 pandemic. However, the extent of access varies by country.¹⁵ As there is a high prevalence of hypertension, risk of experiencing complications and severity if infected with Covid-19, and limited studies on the utilization of health services that focus on hypertension during the pandemic, we designed this study, whose objective was to determine factors associated with the utilization of health services among patients with hypertension during the Covid-19 pandemic. The study's conclusions will be valuable when creating policies and health programs to improve the utilization of health services, with specific relevance for patients with hypertension in Indonesia.

METHODS

Study design and population

This study used a cross-sectional design that was conducted in West Lombok Regency, Indonesia from May to July 2021. The regency consists of 19 health centers. The population includes 8,882 patients aged 18 years and older who had been diagnosed with hypertension.

Sample size and sampling procedure

The sample size was calculated using the sample size for estimating proportion formula.¹⁶ It comprised 435 hypertensive patients diagnosed by physicians who met the following inclusion criteria: aged 18+ years, live in West Lombok Regency, can read and write, and consent to participating in this study. The exclusion criteria

included patients with hypertension who were ill or suffering from complications at the time of the study and/or who were not present at the study site at the time of data collection.

This research used cluster sampling as a sampling technique. Of the 19 health centers in West Lombok Regency, eight were selected using simple random sampling: Dasan Tapen Health Center, Perempuan Health Center, Kediri Health Center, Banyumulek Health Center, Labu Api Health Center, Narmada Health Center, Lingsar Health Center, and Meninting Health Center. Subsequently, the selection of samples from each health center was determined using simple random sampling.

Data collection

This study used a questionnaire as a data collection instrument. This questionnaire was developed based on a review of related literature and consisted of eight parts: (1) general characteristics of respondents (age, gender, education, occupation, income, place of residence, religion, and ethnicity); (2) utilization of health services (utilized versus not utilized, frequency of visits, types of services); (3) affordability (ability to pay for the services), graded on a three-item scale of affordable, somewhat, and unable to pay services; (4) availability (services information), graded on a two-item scale of available and not available; (5) accessibility (distance, ease of access), graded on a four-item scale of very easy, easy, not easy; (6) accommodation (hours of operation, opening and closing times), graded on a four-item scale of very good, good, not good, very not good; (7) acceptability (acceptance of clients to the attitude of health personals, level of satisfaction with services, environment), graded on a four-item scale of very satisfied, satisfied, dissatisfied or very dissatisfied; and (8) health status (health complaint versus no health complaints). Parts 3-7 were assessed

using Bloom's cut-off point, resulting in the categorization of high (80-100%), fair (60-79%), or low (<60%).^{17, 18}

This questionnaire, involving 30 patients with hypertension, has been tested for validity (content validity) and reliability. The results from each part of the questionnaire have been determined to be reliable (Chronbach alpha ranges from 0.70-0.86). Before the data were collected, the participants were given an explanation of the purpose of the study and the meaning of informed consent. After declarations of informed consent had been signed, interviews were conducted with the participants. Ethical approval for this research was obtained from the Regional Development Planning Agency (Bappeda) of the Government of West Lombok Regency, Indonesia (No. 070/300/02-Bappeda/2021), and from the Research Ethics Committee of the Institute of Technology and Health Bali (ITEKES BALI) (No. 02.02.1729.TU.V.2021).

Data analysis

Data entry and analysis were done by using Statistical Package for Social Science (SPSS, version 20). Descriptive statistics (frequency and percentage) were performed to measure the utilization of health services. Bivariate analysis was performed using a Chi-square test to analyze the association between variables. Variables that were found to be statistically significant were then analyzed using multiple logistic regression to determine the factors associated with the utilization of health services among patients with hypertension during the Covid-19 pandemic.

RESULTS

Table 1 shows that, of the 435 patients with hypertension, the majority were aged <55 years (51.5%), female (58.4%), with low education (72.4%), employed (86.2%), had an income of ≤2

million IDR (69.9%), Muslim (95.6%), Sasak (98.6%), and live in rural areas (86.7%).

Table 1 General characteristics of patients with hypertension in West Lombok Regency, Indonesia (n=435)

Characteristics	Number	%
Age		
< 55 years	224	51.5
≥ 55 years	211	48.5
Gender		
Male	181	41.6
Female	254	58.4
Education		
Low	315	72.4
Middle	76	17.5
High	44	10.1
Occupation		
Unemployed	60	13.8
Employed	375	86.2
Monthly income (IDR)		
≤ 2 million	304	69.9
> 2 million	131	30.1
Religion		
Muslim	416	95.6
Hindu	17	3.9
Christian	2	0.5
Ethnicity		
Sasak	429	98.6
Jawa	5	1.1
Sumbawa	1	0.2
Area of residence		
Urban	58	13.3
Rural	377	86.7

Figure 1 shows that most of the patients with hypertension (72.4%) utilized health services for hypertension during the Covid-19 pandemic.

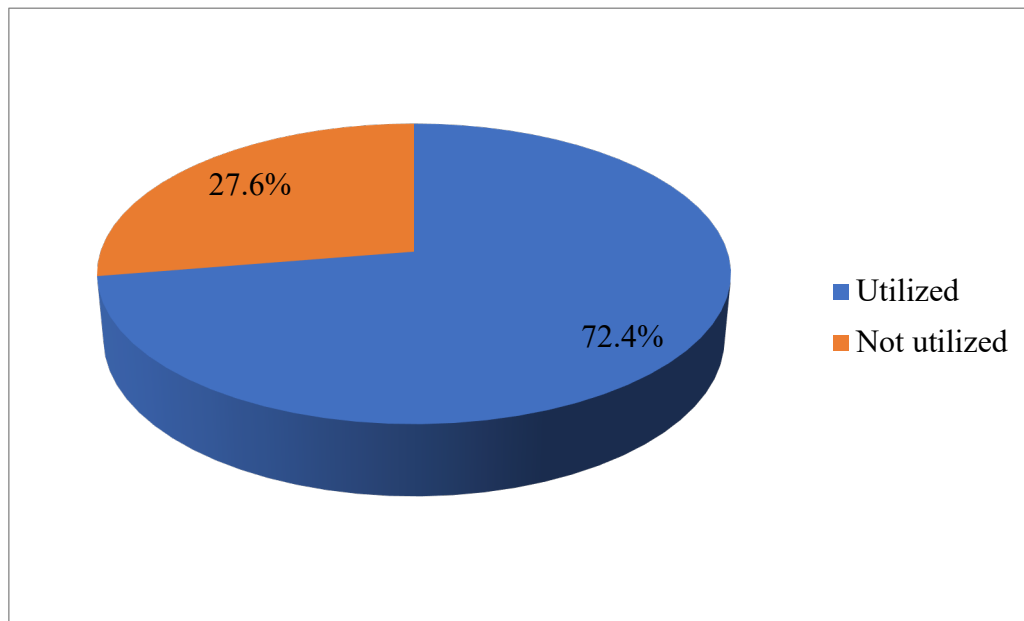


Figure 1 Proportion of health services utilization among patients with hypertension in West Lombok Regency (n=435)

Table 2 shows the results of the bivariate analysis (Chi-square test) with the exception of ethnicity (Fisher's exact test). Several variables were significantly related to the utilization of health services among patients with hypertension during the Covid-19 pandemic, including age

(p<0.002), gender (p<0.001), occupation (p<0.020), income (p<0.001), affordability (p<0.001), availability (p<0.001), accessibility (p<0.001), accommodation (p<0.001), acceptability (p<0.001), and health status (p<0.001).

Table 2 Bivariate analysis of health services utilization among patients with hypertension during Covid-19 pandemic in West Lombok Regency (n=435)

Variables	Utilization of health services		Total	p-value
	Utilized n (%)	Not utilized n (%)		
Age				
<55 years	148 (66.1)	76 (33.9)	224	0.002*
≥55 years	167 (79.1)	44 (20.9)	211	
Gender				
Male	127 (70.2)	54 (29.8)	181	0.376
Female	188 (74.0)	66 (26.0)	254	
Education				
Low	238 (75.6)	77 (24.4)	315	<0.001*
Middle	41 (53.9)	35 (46.1)	76	
High	36 (81.8)	8 (18.2)	44	
Occupation				

Variables	Utilization of health services		Total	p-value
	Utilized n (%)	Not utilized n (%)		
Unemployed	36 (60.0)	24 (40.0)	60	0.020*
Employed	279 (74.4)	96 (25.6)	375	
Income (IDR)				
≤ 2 million	198 (65.1)	106 (34.9)	304	<0.001*
> 2 million	117 (89.3)	14 (10.7)	131	
Religion				
Muslim	298 (71.6)	118 (28.4)	416	0.089
Hindu/Christian	17 (89.5)	2 (10.5)	19	
Ethnicity				
Sasak	313 (73.0)	116 (27.0)	429	0.052
Jawa/Sumbawa	2 (33.3)	4 (66.7)	6	
Place of residence				
Urban	44 (75.9)	14 (24.1)	58	0.528
Rural	271 (71.9)	106 (28.1)	377	
Affordability				
Low	260 (86.7)	40 (13.3)	300	<0.001*
Fair/high	55 (40.7)	80 (59.3)	135	
Availability				
Available	290 (91.2)	28 (8.8)	318	<0.001*
Unavailable	25 (21.4)	92 (78.6)	117	
Accessibility				
Low/fair	92 (48.4)	98 (51.6)	190	<0.001*
High	223 (91.0)	22 (9.0)	245	
Accommodation				
Fair	137 (56.1)	107 (43.9)	244	<0.001*
High	178 (93.2)	13 (6.8)	191	
Acceptability				
Low/fair	17 (14.8)	98 (85.2)	115	<0.001*
High	298 (93.1)	22 (6.9)	320	
Health status				
No health complaints	73 (44.2)	92 (55.8)	165	<0.001*
Health complaints	242 (89.6)	28 (10.4)	270	

*Significant (α 0,05)

Table 3 shows that there was a significant association between health status and access to health services by patients with hypertension during the Covid-19 pandemic (Adj.OR: 0.25; 95% CI 0.12-0.51; $p < 0.001$). Patients with hypertension who had no health complaints were 75% less likely to utilize health services compared to the patients with

health complaints. There was a significant association between availability and the utilization of health services in patients with hypertension during the Covid-19 pandemic (Adj.OR: 6.79; 95% CI 3.04-15.16; $p < 0.001$). Hypertensive patients with available information about services were 6.79 times more likely to utilize health services compared to the patients with

unavailable information about services. There was a significant relationship between acceptability and the utilization of health services by patients with hypertension during the Covid-19

pandemic (Adj.OR:0.06; 95% CI: 0.03-0.13; $p<0.001$). The patients with low/fair acceptability were 94% less likely to utilize health services compared to patients with high acceptability.

Table 3 Multivariate analysis factors associated with utilization of health services among patients with hypertension in West Lombok Regency (n=435)

Variables	B	SE	Adj.OR	95% CI	p-value
Health status					
No health complaints	-1.394	0.366	0.248	0.121-0.509	<0.001
Health complaints*					
Availability					
Available	1.915	0.410	6.789	3.041-15.158	<0.001
Unavailable*					
Acceptability					
Low/fair	-2.845	0.409	0.058	0.026-0.130	<0.001
High*					
Constant	3.182	1.112	24.084		0.004

*Reference group

DISCUSSION

The results of this study indicated that most of the patients with hypertension (72.4%) utilized health services for patients with hypertension during the Covid-19 pandemic in West Lombok Regency. This means that the utilization of health services is not optimal and needs to be improved. The World Health Organization⁸ states that access to and utilization of health services are fundamental human rights. However, a much lower percentage of service access was found at the Mlati II Health Center, Indonesia, meaning that the utilization of health services for patients with hypertension in 2019 was high, reaching 95.31% and dropping to 21.10% in 2020.¹⁹ Another study found that in Malaysia only 19.5% of respondents used health services during the partial lockdown and 33.1% during the lockdown recovery period.²⁰

The low utilization of health services affects uncontrolled hypertension, as well

as contributes to the risk of complications, including cardiovascular disease.^{19, 13, 14} There is much evidence linking hypertension and Covid-19. Data from Indonesia shows that comorbidities in patients with Covid-19 are dominated by hypertension (50.5%), and individuals who died from Covid-19 had a history of hypertension (13.2%), diabetes (11.6%), and heart disease (7.7%).²¹ Multiple comorbidities contribute to the high risk of transmission of Covid-19 and impact disease severity. Groups of people with comorbidities must be prioritized and protected through education, support, and vaccination.²² Other data states that hypertension is the primary factor (30%) of comorbidities compared to diabetes (19%) and coronary heart disease (8%).²³ Hypertension contributes to the greatest risk of disease severity and death in patients with Covid-19. Thus, it is crucial to educate people who have a history of hypertension to maintain their health, keep their blood

pressure under control, and utilize health services.^{24, 21}

Making health services more accessible to people with hypertension is important to encourage the utilization of such services. Indonesia has thousands of health centers, mobile health centers, integrated community services for non-communicable diseases, and home visit programs that are beneficial for people with hypertension. In addition, exercise, maintaining health conditions, and controlling blood pressure through telemedicine are crucial to managing hypertension¹². Therefore, if the utilization of health services can be improved, patients' blood pressure can be controlled, and the risk of complications and death can be prevented.

In this study, the bivariate analysis found that patients' personal characteristics (age, education, occupation, and income) were significantly associated with the utilization of health services among patients with hypertension. First, greater utilization of health services was observed among patients aged 55 or older. This is likely due to the higher frequency of complaints experienced by this age group. Higher levels of education were also associated with higher utilization of health services, which may be attributable to these patients' increased knowledge and awareness of the importance of using health services for blood-pressure control. Furthermore, being in employment and receiving higher levels of income were both associated with greater utilization of health services. This is likely due to the increased affluence enjoyed by these patients, which provides them with greater resources to access health insurance and health services.

There was a significant association between health status and the utilization of health services among patients with hypertension during the Covid-19 pandemic. Respondents without health complaints were 75% less likely to utilize health services than those who had

complaints. The results of this study are in line with those of a study conducted in Dar Es Salaam, Tanzania, which found that health status (lack of complaints) was the characteristic most commonly related to the utilization of health services.²⁵ Another study found that poor health status was associated with the utilization of health services.²⁰

The results of this study indicated that there is an association between availability and the utilization of health services. Respondents with available information about services were 6.79 times more likely to utilize health services than those with unavailable information about services. Respondents who received information about the health services tended to utilize health services during the Covid-19 pandemic. The results of this study are in line with those of a study in Ghana that found that a lack of information contributed to a decline in the use of health services during the Covid-19 pandemic²⁶. Another study states that the availability of doctors is an inhibiting factor in the utilization of health services by patients with hypertension.²⁷

Furthermore, a study in Makassar, Indonesia found that the Covid-19 pandemic made it difficult to provide health services. However, health centers still try their best to provide health services. A patient's family can even pick up their hypertension drugs directly from the health center, as long as health protocols are implemented to prevent Covid-19 transmission.²⁸

This study found that there was an association between acceptability and the utilization of health services for people with hypertension during the Covid-19 pandemic. Respondents with low/fair acceptability were 94% less likely to utilize health services than those with high acceptability. A community with strong cultural and traditional beliefs will consider utilizing health services if physical contact between patients and healthcare providers

of different genders is prohibited. The impact of this situation is the low acceptance of health services and health-seeking behavior for women if the majority of healthcare providers are men.¹¹

In this case, it is very important for health workers to ensure that communities can receive health services provided by the health centers. Satisfaction, friendliness of health workers, and conformity to local socio-cultural aspects must be considered. One study found that service quality is a factor that can inhibit the utilization of health services for patients with hypertension.²⁷ Optimal health services can result in patient satisfaction, even during the Covid-19 pandemic, hypertensive patients continue to utilize health center services.²⁸

LIMITATIONS OF THE STUDY

This study was conducted during the Covid-19 pandemic, which made it difficult to contact respondents during data collection. However, we approached and communicated with the regency government, health centers, and village leaders to interview the respondents by implementing health protocols to prevent the risk of Covid-19 transmission. This study is based on a cross-sectional data; therefore, causal relationships cannot be concluded.

CONCLUSION

Most of the respondents (72.4%) utilized health services for people with hypertension in West Lombok Regency. Factors such as health status, availability, and acceptability were significantly associated with utilization of health services among patients with hypertension during the Covid-19 pandemic. Respondents with no health complaints were 75% less likely to utilize health

services, respondents with available information about services were 6.79 times more likely to utilize health services, and respondents with low/fair acceptability were 94% less likely to utilize health services at the health centers in West Lombok Regency during the Covid-19 pandemic.

Considering that 27.6% of respondents did not utilize the health services, health centers need to improve the utilization of health services by making services more accessible to people with hypertension. The health centers can improve by regularly dispatching mobile health centers in the community, implementing integrated post services for non-communicable diseases, and providing health services through home visits for people with hypertension who have difficulty using health services in health centers. It is important that information about hypertension services is available at health centers. Moreover, it is crucial to convince patients and their families that the staff at health centers are friendly, that the services provided are in accordance with the local socio-cultural customs, and that health protocols are in place to prevent Covid-19 transmission. Meanwhile, self-monitoring of blood pressure and the use of telehealth are additional strategies that could be considered to reduce the risk of Covid-19 transmission.

ACKNOWLEDGMENTS

The authors would like to thank the Institute of Technology and Health Bali, the government of West Lombok Regency, and the health centers for their support and cooperation in this study.

REFERENCES

1. WHO. Hypertension Geneva: World Health Organization [Internet]. 2021 [cited 2021 April 24]. Available from: https://www.who.int/health-topics/hypertension#tab=tab_1.
2. MoH RI. Basic Health Research "Riset Kesehatan Dasar". Jakarta: Ministry of Health Republic of Indonesia Kementerian Kesehatan Republik Indonesia; 2013.
3. MoH RI. Basic Health Research "Riset Kesehatan Dasar". Jakarta: Ministry of Health Republic of Indonesia Kementerian Kesehatan Republik Indonesia; 2018.
4. MoH RI. Report of NTB Province: Basic Health Research 2018 "Laporan Provinsi NTB: Riset Kesehatan Dasar 2018". Jakarta: Ministry of Health Republic of Indonesia Kementerian Kesehatan Republik Indonesia; 2018.
5. Chobanian AV, Bakris GL, Black HR, Cushman WC, Green LA, Izzo Jr JL, et al. The seventh report of the joint national committee on prevention, detection, evaluation, and treatment of high blood pressure: the JNC 7 report. *Jama*. 2003;289(19):2560-71.
6. MoH RI. Hypertension Problem in Indonesia "Masalah Hipertensi di Indonesia" Jakarta: Ministry of Health Republic of Indonesia Kementerian Kesehatan Republik Indonesia [Internet]. 2012 [cited 2021 March 20]. Available from: <https://www.kemkes.go.id/article/view/1909/masalah-hipertensi-di-indonesia.html>.
7. Kalehoff JP, Oparil S. The story of the silent killer. *Current Hypertension Reports*. 2020;22(9):1-14.
8. WHO. Health and human rights: World Health Organization [Internet]. 2017 [cited 2021 September 5]. Available from: <http://www.who.int/mediacentre/factsheets/fs323/en/>.
9. Swarjana IK, Natkamol C, Nawarat S, Punyarat L, Kwanjai A. Disparities in utilization of maternal health services in the rural areas of Indonesia: an analysis among provinces with low, middle, and high poverty rates. *J Public Hlth Dev*. 2020;3(18):49-63.
10. Phillips KA, Morrison KR, Andersen R, Aday LA. Understanding the context of healthcare utilization: assessing environmental and provider-related variables in the behavioral model of utilization. *Health Serv Res*. 1998;33(3 Pt 1):571.
11. Levesque JF, Harris MF, Russell G. Patient-centred access to health care: conceptualising access at the interface of health systems and populations. *Int J Equity Health*. 2013;12(1):1-9.
12. Kario K, Morisawa Y, Sukonthasarn A, Turana Y, Chia Y, Park S, et al. COVID-19 and hypertension-evidence and practical management: Guidance from the HOPE Asia Network. *J Clin Hypertens*. 2020;22(7):1109-19.
13. Zhou D, Xi B, Zhao M, Wang L, Veeranki SP. Uncontrolled hypertension increases risk of all-cause and cardiovascular disease mortality in US adults: the NHANES III Linked Mortality Study. *Scientific reports*. 2018;8(1):1-7.
14. Oparil S, Acelajado MC, Bakris GL, Berlowitz DR, Cífková R, Dominiczak AF, et al. Hypertension. *Nature reviews Disease primers*. 2018;4:18014-.
15. Moynihan R, Sanders S, Michaleff ZA, Scott AM, Clark J, To EJ, et al. Impact of COVID-19 pandemic on utilisation of healthcare services: a systematic review. *BMJ open*. 2021;11(3):e045343.
16. Daniel WW, Cross CL. *Biostatistics: a foundation for analysis in the health sciences*: Wiley; 2013.
17. Jawed F, Manazir S, Zehra A, Riaz R. The novel Coronavirus disease (COVID-19) pandemic: Knowledge, attitude, practice, and perceived stress among health care workers in Karachi,

-
- Pakistan. *Med J Islam Repub Iran*. 2020;34:132.
18. Mahdaviazad H, Keshtkar V, Emami MJ. Osteoporosis guideline awareness among Iranian family physicians: results of a knowledge, attitudes, and practices survey. *Prim Health Care Res Dev*. 2018;19(5):485-91.
 19. Fitri AS. Evaluation of Hypertension Services During Covid-19 Pandemic in Mlati Health Center II Sleman Regency "Evaluasi Pelayanan Hipertensi Pada Masa Pandemi Covid-19 di Puskesmas Mlati II Kabupaten Sleman": Diponegoro University; 2021.
 20. Yunus SZSA, Puteh SEW, Ali AM, Daud F. The Covid Impact to Public Healthcare Utilization Among Urban Low-Income Subsidized Community in Klang Valley Malaysia. *Health Serv Res Manag Epidemiol*. 2021;8: 23333928211002407.
 21. MoH RI. 13.2 Percent of Covid-19 Patient Deaths Having Hypertension "13,2 Persen Pasien COVID-19 yang Meninggal Memiliki Penyakit Hipertensi" Jakarta: Ministry of Health Republic of Indonesia Kementerian Kesehatan Republik Indonesia [Internet]. 2020 [cited 2021 August 27]. Available from: <https://www.kemkes.go.id/article/view/20101400002/13-2-persen-pasien-covid-19-yang-meninggal-memiliki-penyakit-hipertensi.html>.
 22. Vila-Córcoles A, Ochoa-Gondar O, Satué-Gracia EM, Torrente-Fraga C, Gomez-Bertomeu F, Vila-Rovira A, et al. Influence of prior comorbidities and chronic medications use on the risk of COVID-19 in adults: a population-based cohort study in Tarragona, Spain. *BMJ open*. 2020;10(12): e041577.
 23. Schiffrin EL, Flack JM, Ito S, Muntner P, Webb RC. Hypertension and COVID-19. *Am J Hypertens*. 2020.
 24. Zhang J, Wu J, Sun X, Xue H, Shao J, Cai W, et al. Association of hypertension with the severity and fatality of SARS-CoV-2 infection: A meta-analysis. *Epidemiol Infect*. 2020;148.
 25. Bovet P, Gervasoni JP, Mkamba M, Balampama M, Lengeler C, Paccaud F. Low utilization of health care services following screening for hypertension in Dar es Salaam (Tanzania): a prospective population-based study. *BMC public health*. 2008;8(1):1-8.
 26. Saah FI, Amu H, Seidu AA, Bain LE. Health knowledge and care seeking behaviour in resource-limited settings amidst the COVID-19 pandemic: A qualitative study in Ghana. *Plos one*. 2021;16(5):e0250940.
 27. Legido-Q.H., Naheed A, de Silva HA, Jehan I, Haldane V, Cobb B, et al. Patients' experiences on accessing health care services for management of hypertension in rural Bangladesh, Pakistan and Sri Lanka: A qualitative study. *PLoS One*. 2019;14(1): e0211100.
 28. Azizah AN, Raodhah S, Surahmawati S, Alam S. Utilization of The Chronic Disease Management Program During The Covid-19 Pandemic. *Diversity: Dis Preventive of Res Integr*. 2020;1(1):21-9.
-