



RELATIONSHIP BETWEEN ANXIETY LEVEL IN PANDEMIC AND MEDICAL ADHERENCE IN HYPERTENSIVE ELDERLY

Haidar Yusuf Affandy¹, Ari Budi Himawan^{2*}, Natalia Dewi Wardani³, Aras Utami²



CrossMark

¹Department of Medicine, Faculty of Medicine, Diponegoro University, Indonesia

²Department of Public Health, Faculty of Medicine, Diponegoro University, Indonesia

³Department of Psychiatry, Faculty of Medicine, Diponegoro University, Indonesia

Keywords:

*Adherence
Anxiety
COVID-19
Elderly
hypertension*

ABSTRACT

Background: Hypertension in Indonesia increases with age. People with hypertension need continuous treatments according to doctor's recommendation, if not it will cause serious complications. Medication non-adherence of hypertensive elderly caused by many factor, one of them is psychological factor. Health care visits decrease during pandemic because of the COVID-19 transmission anxiety

Objective:. To find out the correlation between anxiety level and medical adherence of hypertensive elderly in Kangkung Village, Mranggen during the COVID-19 pandemic

Methods: Cross-sectional study was conducted with Proportional Random Sampling approach on 96 hypertensive elderly in Kangkung, Mranggen, Demak Regency. The study was conducted by interview using Zung Self-rating Anxiety Scale and Morisky Medical Adherence Questionnaire. Data analysis using Rank Spearman correlation test. This study had got Ethical Clearance from Health Research Ethics Committee of Faculty of Medicine of Diponegoro University.

Results: There was a correlation between anxiety level and medical adherence, p value = 0,005 ($p < 0,01$) and the higher anxiety level will decrease the medical adherence ($\rho = -0,287$)

Conclusion: Anxiety that were experienced by the elderly has been shown to be related to medical adherence during the COVID-19 pandemic

*) Correspondence to:
aribudihimawan@gmail.com

Article history:

Received 12-06-2022
Accepted 19-07-2022
Availableonline30-12-2022

DIMJ, 2022, 3(2), 42-48 DOI: <https://doi.org/10.14587/dimj.v3i2.14587>

1. Introduction

Increasing the quality of health service and change to healthier lifestyle will lead to a rise in life expectancy of the population. This will lead to an incline in the number of senior age citizens in all around the world, including Indonesia. According to Statistics Indonesia, in 2020, senior age citizen comprises of 10.7% and is predicted to keep surging.¹ Senior age is the last stage in human life, where physiological function of the body declines. This decrease in function may create various health problems, such as hypertension.^{2,3}

Hypertension is the condition where blood pressure is above normal rate ($>130/80$ mmHg).⁴ This condition was a "silent killer", where the symptoms that appear are rather diverse and often are not related and dependent on blood pressure levels. Common symptoms of severe hypertension that may appear were headaches, anxiety, heart pounding, nausea, blurry vision, chest pain, and fatigue.⁵

Based on 2018 Indonesian Basic Health Research (Riskesdas), hypertension patients in Indonesia reached 34.11%, with the highest proportion found in age group of 45-75 year old and increases with age.⁶ In Central Java, the prevalence of hypertension reaches 37.5% or 8,070,378 patients, with prevalence in males to be more common than females.⁷ In Demak Regency, Central Java, there were 309,697 patients. However, only 27.5% checks up regularly to health facilities. Hypertension in Mranggen I Puskesmas is the third highest level in Demak Regency with 15,599 patients.⁸ Kangkung Village, which is one of the villages under Mranggen I Puskesmas, has a population of 7,488, with 11.1% of them were senior citizens. Hypertension (57%), joint disorders (40%), anemia (30%), and cataract (15%) were the most common diseases suffered by seniors in that area.³

Hypertension requires constant medication per doctor's order. If not obeyed, it may cause serious complications, such as congestive heart failure, stroke, vision disorders, renal disease, even death.⁹⁻¹¹

Disobedience in medication is caused by internal and external factors, for instance socio-demographic, healthcare system, medication, perception of patient, knowledge, and psychology of the patient.¹² Several prior studies explained that depression and anxiety can cause someone to be disobedient to anti-hypertension medication.¹³⁻¹⁸

Anxiety is a subjective feeling which covers uneasiness, discomfort, and fear that may disrupt and inhibit activities, including health. During the COVID-19 pandemic, senior citizens visitation to health facilities decreases from 66% in 2019 to 51% in 2020.^{19,20} This is caused by fear and anxiety from senior citizens of contracting COVID-19.²¹

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) was found first in Wuhan, China, in December 2019. It then spread fast throughout the world, which prompted WHO to label it as a pandemic. SARS-CoV-2 spreads from human to human through droplets and infects the respiratory tract which causes Coronavirus Disease 2019 (COVID-19).²²

2. Methods

A cross-sectional study was conducted on July 2021 to senior citizens with hypertension in Kangkung, Mranggen, Demak Regency. Choosing of the samples was done through proportional random sampling from three regions in Kangkung Village. This research was done through direct interviews with senior citizens with hypertension who has signed informed consent and fulfill inclusion criteria using Zung Self-rating Anxiety Scale to evaluate anxiety and Morisky Medical Adherence Questionnaire to evaluate medical adherence.

Inclusion criteria of this study were senior citizens with the age of ≥ 60 years old who has hypertension that is recorded in Mranggen I Puskesmas, able to do daily activities, and under anti-hypertension therapy. Exclusion criteria of this study were seniors who consume psychiatric drugs and seniors that were diagnosed with mental disorders.

Hypertension and senior age were conditions that become COVID-19 comorbidity, which in turn increases the severity degree and mortality rate. COVID-19 pandemic that has been around for the past year damages the everyday life of society. Massive disasters like this were prone to cause mental disorders, such as Post Traumatic Stress Disorder (PTSD), increase in anxiety, and other disorders.²³

Information on the high death rate due to COVID-19, increase in daily cases, and spread of false news induces fear and anxiety that worsen the psychological condition of the society, including seniors who have a chronic disease such as hypertension. In theory, the psychological factors may have a role in the decrease of medical adherence of seniors with hypertension to healthcare facilities, which prompts the urgency of this research to answer the question: does anxiety in seniors with hypertension during the COVID-19 pandemic relate to the degree of medical adherence?

Data analysis was carried out using the Rank Spearman correlation test. To assess the strength of the relationship between two variables using the value of correlation coefficient (ρ).

3. Results

This research includes 96 seniors with hypertension in Kangkung, Mranggen, Demak Regency, with the characteristics as follows. Based on Table 2, the oldest subject was 87 years old where the majority were female (58,3%) with an average of 4.57 years suffering from hypertension. Most of the subjects went to general practitioner (42,7%) for regular checkups where the average distance from their home to the nearest health service was 3,12 KM. Usually they come to health services alone (57,3%) even though the majority live with their families (77,1%). From 96 subjects, 47% of them experienced mild anxiety. In addition, 42,7% of subjects had low adherence.

Table 1 Characteristics of Sample

Variable	Mean \pm SD	Min – Max
Age	70,06 \pm 0,734	60 - 87
Duration of Hypertension	4,57 \pm 0,33	1 - 17
Distance to Healthcare Facility	3,12 \pm 1,92	0,6 - 8

Table 2 Characteristics of Sample (Continued)

Variable	N	%
Gender		
Male	40	41,7
Female	56	58,3
Access To Healthcare Services		
Alone	55	57,3
Accompanied	41	42,7
Place of Treatment		
Puskesmas	23	24
Clinic	32	33,3
General Practitioner	41	42,7
Lives Alone		
Yes	22	22,9
No	74	77,1
Anxiety Level		
Normal/Not Anxious	10	10,4
Mild	47	49
Moderate	39	40,6
Severe	0	0
Adherence Level		
Not Adherent	35	36,5
Low Adherence	41	42,7
High Adherence	20	20,8

Table 3 Causes of anxiety

Cause of Anxiety	N	%
Relatives/Neighbors diagnosed with COVID-19	60	69,8
Heard information of the increase in positive cases and death due to COVID-19	27	31,4
Went to a crowded public space	56	65,1
Went to healthcare services	71	82,6

Table 4 Reasons why the elderly doesn't take their medications

Causes of the elderly not taking their medication	N	%
Afraid to go to healthcare services	41	47,7
Feel well/have no complaints about their diseases	30	34,9
Forget time to check with the doctor	27	31,4

Table 5 Relationship of Anxiety Levels and Medical Adherence Degree

Variable	Medical Adherence Degree						p
	Not Adherent		Low Adherence		High Adherence		
	N	%	N	%	N	%	
Anxiety Levels							
Normal/None	0	0	2	20	8	80	0,005
Mild Anxiety	18	38,3	22	46,8	7	14,9	
Moderate Anxiety	17	43,6	17	43,6	5	12,8	

The cause of anxiety in the hypertensive elderly during the pandemic was mostly because they have to go to health services regularly (82,6%) and there were relatives or neighbors who have been diagnosed with COVID-

19 (69,8%). While the majority of subjects said the reasons they did not regularly take their medications was that they were afraid to go to healthcare services (47,7%).

Based on table 5 out of 10 subjects who did not experience anxiety level, 80% of them had high adherence. While the majority of subjects with mild anxiety had low adherence (46,8%) and subjects with moderate anxiety were not adherent (43,6%).

4. Discussions

There was a relationship between anxiety during the COVID-19 pandemic with medical adherence of seniors with hypertension, where $p < 0.01$. This cross-tabulation result shows that patients with high anxiety levels tend to be less adherent and patients with low anxiety levels tend to be more adherent. The power of this relationship was on the weak category with correlation category number $\rho = - 0,287$. The direction of the relationship of these variables was inversely proportionate.

Anxiety was a physiological reaction towards a situation that may impose a threat to life. Anxiety symptoms may appear individually or with other symptoms of emotional disorders. Anxiety symptoms cover affective and somatic symptoms, including symptoms on musculoskeletal, cardiovascular, respiration, gastrointestinal, genitourinary, dermal, and central nervous systems.²⁴ This was in line with what the majority of the respondents feel, which are fainting, feeling down and destroyed, nightmares, and hot flashes.

Results show that there were 10.4% of seniors who do not feel anxious and, according to direct interviews, do not think that COVID-19 was real. Perception was a cognitive process to translate stimulus accepted and was subjective, depending on the condition and ability of someone to process it.²⁵ This causes a stimulus to be translated differently across each person.²⁶ The perception of someone towards a disease that was not felt or threatens their lives will not cause anxiety to them.²⁷ The wrong perception towards the dangers or threats of a disease, the damage it could cause, and the benefits of preventing it will cause someone to not feel anxious, hence no changes in habits were made.²⁸ Mislead perception of a disease may be influenced by the lack of information and knowledge obtained. Some respondents did not feel anxious because they have obtained information and did prevention attempts regarding COVID-19. Constant exposure to information will increase understanding and prevention attempts towards a disease, which will lead to a decrease in anxiety.²⁹

Anxiety in seniors was caused by fear of contracting COVID-19. Anxiety usually appears when seniors heard information about the death rate due to COVID-19 and COVID-19 infection rate that keeps rising. Besides that, seniors who know that they were

more susceptible to infection become more anxious whenever they need to go outside, especially to a crowded place, such as a healthcare facility. This was in line with other studies which stated that an increase in COVID-19 cases created anxiety to themselves due to susceptibility and easy exposure of COVID-19 infection.³⁰⁻³²

This study shows that majority of seniors had a low adherence level (42.7%) and were not adherent (36.5%). Medical adherence was a positive behavior shown to help cater to therapeutic aims, where patients willingly follow clinical advice from doctors who took care of them.^{12,33} Factors that influence medical adherence were sustainability perception, signs of taking medicines, severity perception, benefits perception, and inhibition perception.³⁴ In this study, disobedience happens due to seniors feeling scared to go to healthcare facilities because they believe that they may contract COVID-19 there. Based on several studies, one of the places that had a potential for someone to contract COVID-19 was healthcare facilities, both hospitals and Puskesmas.^{35,36} Fear of coming to healthcare facilities results in the decrease of medical adherence in seniors.

Respondents in this study also did not suffer from any symptoms (severity perception) which resulted in them not going on medical treatments and made them forgot to check up regularly. Severity perception was the perception of someone towards how severe their disease was, including clinical condition due to the illness and its social consequences. When someone thought that an illness as something that was not serious, that person would not undergo prevention nor curative measures.^{26,37}

Patients with anxiety have a relation with the decrease of medical adherence caused by the perception that they were unable to do certain things, such as adhering to a medication attempt.¹² This was also stated by several researchers who found that constant psychological pressure (anxiety) of someone contributed to their decrease in medication adherence.^{17,38} Anxiety was reported to decrease someone's ability to adhere to doctor's orders on ongoing treatment.³⁹

Medication compliance could be influenced by various things such as duration of hypertension, access and distance to health care services, and other individual factors. Previous studies revealed that the longer a person suffers from hypertension, the more

they disobey their medication. This was related to how long a person takes medication. When a person has been taking medication for a long time, that person will tend to be bored and choose to stop taking their medication.^{40,41} In this study, it was found that there was no significant relationship between the duration of hypertension and adherence to medication. This was possible because the length of time someone suffering from hypertension did not necessarily describe how long they had been taking medication.⁴²

Access to health care services was related to costs of medication so that the more difficult access was and the farther the distance to healthcare services, the higher the cost for medication. When the cost of medication was expensive, someone will tend not to take medication.⁴¹ In this study, access was assessed by how far health care services were and how the elderly visited there. The results of the analysis showed that there was no significant correlation between access to healthcare services with medication adherence. This was because the majority of elderly receive treatment at doctors' practices and clinics that have relatively close to their house, besides that access to healthcare services in Kangkung Village was relatively easy and cheap.

Individual factors such as gender and age can also affect medication adherence. Another study stated that women tend to have higher compliance due to their attention to health conditions than men.⁴³ However, in this study, there was no relationship between gender and medication adherence. This result can be caused by the existence of a pandemic condition that affects both men and women where both tend to have a sense of worry and fear when they have to go to healthcare services.

Alphonse stated that there was a relationship between age and medication adherence where productive age tends to have a low level of adherence. This was because their busyness at work causes them not to take regular treatment.⁴³ In contrast to the results of this study where there was no significant relationship. These results were due to differences in the samples taken which Alphonse's study was conducted on hypertensive patients aged over 18 years, while this study only covered the elderly aged 60 years and over so that the age range of the sample was narrower.

The limitation of this research was that it was only done through a certain duration (cross-sectional). Hence, a thorough investigation to evaluate adherence level cannot be done maximally. It is suggested that future research may use the cohort method to follow a group from the start of a medication into a certain timeframe.

5. Conclusion

Based on the study conducted, there was a weak relationship between anxiety in seniors with hypertension and medical adherence. The direction of the relationship between the two variables were negative, which means that the higher the anxiety, the lower the adherence.

Ethical Approval

This study was approved ethically by the Health Research Ethics Committee of the Faculty of Medicine of Diponegoro University with the certificate number 198/EC/KEPK/FK-UNDIP/VI/2021.

Conflicts of Interest

The authors declare that there was no conflict of interest.

Funding

No specific funding was provided for this article

Author Contributions

Conceptualization, Haidar Yusuf Affandy; methodology, Haidar Yusuf Affandy, Ari Budi Himawan, Natalia Dewi Wardani; software, Haidar Yusuf Affandy; writing—original draft preparation, Haidar Yusuf Affandy; writing—review and editing, Ari Budi Himawan, Natalia Dewi Wardani, Aras Utami; supervision, Ari Budi Himawan, Natalia Dewi Wardani, Aras Utami.

Acknowledgments

This work was supported by the Department of Medicine, Department of Public Health and Department of Psychiatry, Faculty of Medicine, Diponegoro University.

References

1. Subdirektorat Statistik Pendidikan dan Kesejahteraan Sosial. Statistik Penduduk Lanjut Usia. (Susilo D, Sinang R, Rachmawati Y, Santoso B, eds.). Badan Pusat Statistik; 2020.
2. Armiyati Y, Soesanto E, Hartiti T. Optimalisasi Pemberdayaan Kader Posbindu Lansia sebagai Upaya Peningkatan Kualitas Hidup Lansia di Demak. *Jurnal Keperawatan Komunitas*. 2014;2(2):57-63.
3. Soesanto E, Abdurrahman NN. The Role of Volunteers in Improving Services in Elderly Integrated Service Centers. *South East Asia Nursing Research*. 2020;2(1):22. doi:10.26714/seanr.2.1.2020.22-26
4. Rowland K. JNC VIII guidelines. *Evidence-Based Practice*. 2014;17(9).

5. Tiara UI. Hubungan Obesitas Dengan Kejadian Hipertensi. *Journal of Health Science and Physiotherapy*. 2020;2(2):167-171. doi:10.35893/jhsp.v2i2.51
6. Badan Penelitian dan Pengembangan Kesehatan. Laporan Nasional Riskesdas 2018. Kementerian Kesehatan Republik Indonesia; 2019.
7. Dinas Kesehatan Provinsi Jawa Tengah. Profil Kesehatan Provinsi Jawa Tengah Tahun 2019. Dinas Kesehatan Provinsi Jawa Tengah; 2019.
8. Seksi Pencegahan dan Pengendalian Penyakit tidak Menular dan Kesehatan Jiwa. Profil Kesehatan Kabupaten Demak Tahun 2020. Dinas Kesehatan Kabupaten Demak; 2020.
9. Nadar SK, Lip GYH. The heart in hypertension. *Journal of Human Hypertension*. Published online October 12, 2020;1-4. doi:10.1038/s41371-020-00427-x
10. Kario K, Chia YC, Sukonthasarn A, et al. Diversity of and initiatives for hypertension management in Asia—Why we need the HOPE Asia Network. *Journal of Clinical Hypertension*. 2020;22(3):331-343. doi:10.1111/jch.13733
11. Zeru AB, Muluneh MA. Admission and inpatient mortality of hypertension complications in Addis Ababa. *Integrated Blood Pressure Control*. 2020;13:103-110. doi:10.2147/IBPC.S268184
12. Burnier M, Egan BM. Adherence in Hypertension : A Review of Prevalence, Risk Factors, Impact, and Management. *Compendium on the Pathophysiology and Treatment of Hypertension*. Published online 2019:1124-1140. doi:10.1161/CIRCRESAHA.118.313220
13. Bautista LE, Vera-cala LM, Colombo C, Smith P. Symptoms of Depression and Anxiety and Adherence to Antihypertensive Medication. *American Journal of Hypertension*. 2012;25(4):505-511. doi:10.1038/ajh.2011.256
14. Asgari MR, Bouraghi H, Mohammadpour A, Haghghat M, Ghadiri R. The Role of Psychosocial Determinants in Predicting Adherence to Treatment in Patient with Hypertension. *Interventional Medicine & Applied Science*. 2020;11(1):8-16. doi:10.1556/1646.10.2018.43
15. Dimatteo MR, Lepper HS, Croghan TW. Depression Is a Risk Factor for Noncompliance With Medical Treatment. *Arch Intern Med*. 2015;160:2101-2107.
16. Kretchy IA, Owusu-daaku FT, Danquah SA. Mental Health in Hypertension : Assessing Symptoms of Anxiety , Depression and Stress on Anti-hypertensive Medication Adherence. *International Journal of Mental Health Systems*. 2014;8(1):1-6. doi:10.1186/1752-4458-8-25
17. Golshiri P, Tavakoli A, Najimi A. The Role of Depression, Anxiety, and Stress in Medication Adherence in Patients with Hypertension. *Journal of Isfahan Medical School*. 2017;35:781-788.
18. Roohafza H, Kabir A, Sadeghi M, Shokouh P. Stress as a Risk Factor for Noncompliance with Treatment Regimens Abstract Original Article. *ARYA Atheroscler*. 2016;12(4):166-171.
19. Puskesmas Mranggen 1. Laporan Profile Puskesmas Mranggen 1 Tahun 2020.; 2020.
20. Sub Bagian Umum dan Kepegawaian Dinas Kesehatan Kabupaten Demak. Profil Kesehatan Kabupaten Demak Tahun 2019. Dinas Kesehatan Kabupaten Demak; 2020.
21. Ilpaj SM, Nurwati N. Analisis Pengaruh Tingkat Kematian Akibat Covid-19 Terhadap Kesehatan Mental Masyarakat Di Indonesia. *Focus : Jurnal Pekerjaan Sosial*. 2020;3(1):16. doi:10.24198/focus.v3i1.28123
22. Sohrabi C, Alsafi Z, O'Neill N, et al. World Health Organization declares global emergency: A review of the 2019 novel coronavirus (COVID-19). *International Journal of Surgery*. 2020;76:71-76. doi:10.1016/j.ijsu.2020.02.034
23. Sood S. Psychological effects of the Coronavirus. *RHiME*. 2020;7(April):23-26.
24. Setyowati A, Chung MH, Yusuf A. Development of Self-report Assessment Tool for Anxiety among Adolescents : Indonesian Version of the Zung Self-rating Anxiety Scale. *Journal of Public Health in Africa*. 2019;10(S1). doi:10.4081/jphia.2019.1172
25. Fatimah S, Indrawati F. Faktor Pemanfaatan Pelayanan Kesehatan di Puskesmas. *Higeia Journal of Public Health Research and Development*. 2019;1(3):84-94.
26. Purnamasari VD. Pengetahuan dan Persepsi Peserta Prolanis dalam Menjalani Pengobatan. *Jurnal kesehatan Masyarakat*. 2015;3(3).
27. Fitri D, Ifdil A&. Konsep Kecemasan (Anxiety) pada Lanjut Usia (Lansia). *Konselor*. 2016;5(2):93-99. Accessed February 13, 2021. <http://ejournal.unp.ac.id/index.php/konselor>
28. Green EC, Murpy EM, Grybosky K. The Health Belief Model. *The Wiley Encyclopedia of Health Psychology*. Cambridge Handbook of Psychology, Health and Medicine, Second Edition. 2020;2:97-102. <https://doi.org/10.1002/9781119057840.ch68>
29. Aritonang J, Sirait A, Lumbantoruan M. Pendidikan Kesehatan Pada Kelompok Lansia Untuk Mengurangi Kecemasan di Era Pandemi Covid-19. *Jurnal Sosial & Abdimas*. 2021;3(2):48-55.
30. Malesza M, Kaczmarek MC. Predictors of Anxiety during the COVID-19 Pandemic in Poland. *Personality and Individual Differences*. 2021;170(July 2020):110419. doi:10.1016/j.paid.2020.110419
31. Alyami HS, Naser AY, Dahmash EZ, Alyami MH, Alyami MS. Depression and Anxiety during the COVID-19 Pandemic in Saudi Arabia: A Cross-sectional Study. *International Journal of Clinical Practice*. 2021;75(7):1-9. doi:10.1111/ijcp.14244
32. Hyland P, Shevlin M, McBride O, et al. Anxiety and Depression in the Republic of Ireland during the COVID-19 Pandemic. *Acta Psychiatrica Scandinavica*. 2020;142(3):249-256. doi:10.1111/acps.13219
33. Sieverink F, Kelders SM, Gemert-Pijnen V. Clarifying the Concept of Adherence to eHealth Technology: Systematic review on When Usage becomes Adherence. *Journal of Medical Internet Research*. 2017;19(12). doi:10.2196/jmir.8578
34. Rahayu B agustina, Hikmawati AN, Amry YR. Teori Health Belief Model Digunakan Sebagai Analisa

Kepatuhan Minum Obat Pada Penderita Hipertensi. *Jurnal Keperawatan*. 2017;13(4):25-34.

35. Apriningsih H, Prabowo NA, Myrtha R, Gautama CS, Wardani MM. Prevention of Transmission of Covid-19 in Health Workers in. *Jurnal Ilmiah Pengabdian kepada Masyarakat*. 2020;4(2):556-564.

36. Baek YJ, Lee T, Cho Y, et al. A Mathematical Model of COVID-19 Transmission in a Tertiary Hospital and Assessment of the Effects of Different Intervention Strategies. *PLoS ONE*. 2020;15(10):1-16. doi:10.1371/journal.pone.0241169

37. Soesanto E, Marzeli R. Persepsi Lansia Hipertensi Dan Perilaku Kesehatannya. *Jurnal Keperawatan dan Kesehatan Masyarakat Cendekia Utama*. 2020;9(3):244-251.

38. Fan Y, Shen BJ, Tay HY. Depression, Anxiety, Perceived Stress, and Their Changes Predicted Medical Adherence Over 9 Months among Patients with Coronary Heart Disease. *British Journal of Health Psychology*. 2021;26(3):748-766. doi:10.1111/bjhp.12496

39. Eisele M, Harder M, Rakebrandt A, et al. Association of depression and anxiety with adherence in primary care patients with heart failure-cross-sectional results of the observational RECODE-HF cohort study. *Family Practice*. 2021;37(5):695-702. doi:10.1093/FAMPRA/CMAA042

40. Puspita E. Faktor-Faktor Yang Berhubungan Dengan Kepatuhan Penderita Hipertensi Dalam Menjalani Pengobatan (Studi Kasus di Puskesmas Gunungpati Kota Semarang). Doctoral Dissertation. Universitas Negeri Semarang. 2016.

41. Prihatin K, Fatmawati BR, Suprayitna M, Keperawatan PS, Pengobatan K. Faktor-Faktor yang Mempengaruhi Kepatuhan Berobat Penderita Hipertensi. *Jurnal Ilmiah Stikes YARSI Mataram (JISYM)*. 2020;10(2):7-16.

42. Wahyudi CT, Ratnawati D, Made SA. Pengaruh Demografi, Psikososial, Dan Lama Menderita Hipertensi Primer Terhadap Kepatuhan Minum Obat Antihipertensi. *Jurnal JKFT*. 2018;2(2):14. doi:10.31000/jkft.v2i1.692

43. Alphonse A. Factors affecting treatment compliance among hypertension patients in three DISTRICT hospitals-dar es salaam. *Muhimbili Univ Health Allied Sci*. 2012;9:129-1