Poltekita: Jurnal Ilmu Kesehatan
http://jurnal.poltekkespalu.ac.id/index.php/JIK

Vol.16 No.4 February 2023: Hal. 436-442
p-ISSN: 1907-459X e-ISSN: 2527-7170

Original Article

Correlation between Socio-economic Factors and Stress with Hypertension Cases during the Covid-19 Pandemic

Firanggi Z. A. Benu[1*], Indriati A. Tedju Hinga[1], Eryc Z. Haba Bunga[1]
[1] Faculty of Public Health, Universitas Nusa Cendana, Indonesia

(Correspondence author's email, firangghy.benu@gmail.com/+6282247969811)

ABSTRACT

Hypertension is often referred to as The Silent Killer because it is the second leading cause of death after hear disease. Hypertension cannot be due to single cause but multifactorial causes, wherein many factors can be a risk for hypertension. This study aims to analyze the correlation between socio-economic factors and stress with hypertension cases during the Covid-19 pandemic at Sikumana Community Health Center. This was an analytical observational study with a case control design. The study samples involved 84 respondents who were assigned in the case and control groups consisting 42 respondents, respectively, or with a ratio of 1:1. Data were analyzed using the chi square test by calculating the OR value. The results of this study indicated that there was a correlation between income (p= 0.016; OR= 3.21; 95% CI 1.33-8.05), employment status (p= 0.029; OR= 2.91; 95% CI 1.20 -7.15), education level (p= 0.004; OR= 4.06; 95% CI 1.62-10.13) and stress (p= 0.000; OR= 8.17; 95% CI 3.05-21.91) with hypertension. It can be concluded that there was a correlation between socio-economic factors (income, employment status, and education) and stress with hypertension cases in the work area of Sikumana CHC, Kupang City. Provision of education related to diverse food consumption pattern and stress management must be increased.

Keywords : Socio-economic Factors, Stress, Hypertension.

https://doi.org/10.33860/jik.v16i4.1626

INTRODUCTION

Non-Communicable Diseases are diseases that are not caused by infection of microorganisms such as protozoa, bacteria, fungi, or viruses. This type of disease is responsible for 70% of deaths in the world[1]. Hypertension is defined as a condition in which blood pressure rises steadily. A person can be said to have hypertension if he has systolic blood pressure of ≥140 mmHg and diastolic blood pressure of ≥90mmHg which are measured twice with an interval of five minutes[2].

Based on the 2019 World Health Organization (WHO) report, around 1.28 billion people in the world in the last thirty years from 1990-2019, had hypertension. The number of people with hypertension continues to increase every year, and it is estimated that by 2025 there will be 1.5 billion people with hypertension and 10.44 million people will die from hypertension and its complications[3]. Institute for Health Metrics and Evaluation (IHME) also stated that out of a total of 1.7 deaths in Indonesia was caused by many factors including high blood pressure or hypertension by 23.7%, hyperglycemia by 18.4%, smoking by 12.7% and obesity by 7.7%[4]. Based on the results of Baaic Health Research data for the Province of East Nusa Tenggara in 2018, the prevalence of hypertension by diagnosis, medication and the results of measurements in the population aged >18 years were 7.2%, and 4%, and 27.7%, respectively[5].

Kupang is a city that cannot be separated from hypertension. Hypertension is included in the top five Non-Communicable Diseases in CHCs in 2021 with the highest number of sufferers in January to June 2021 by 919 people, followed by diabetes mellitus by 260 people, obesity by 316 people, stroke by 33

people, and osteoporosis by 24 people. Such findings indicated that hypertension was the most dominant health problem in every CHC in Kupang City. Sikumana CHC occupies the first position out of 10 existing CHCs in Kupang City in 2021 with a total of 1,995 cases.

The increase in hypertension is driven by the main risk factors of lifestyle and stress condition. Non-communicable diseases have health consequences towarda individuals, families as well as communities. Another factor that influences the incidence of hypertension is the state of socioeconomic status. Low socio-economic status is associated with poor health status. This is related to lifestyle, unhealthy diet, type of work and the level of education.

The theory put forward by Mac Mohan and Pugh (1970) regarding the concept of the occurrence of a disease is referred to as the causal network theory in Notoatmodjo 2011. Such theory emphasizes that a disease occurs due to the interaction of various factors. For example, environmental interactions consisting of biological, chemical and social environments play a very important role in the occurrence of a disease[6].

Based on interviews with healthcare workers at Sikumana CHC, it was revealed that in controlling hypertension, many people had not yet implemented a healthy lifestyle, namely in choosing types of food to consume every day, as well as the economic status of families who were considered unable to buy highly nutritious foods to control hypertension. The Covid-19 pandemic situation that has taken place in the last few years certainly had an impact. There were changes within oneself as well as the social environment which further increased stress level in these circumstances. The pandemic has even caused psychological crises and health crises such as fear, anxiety, depression or insecurity, which surely have a negative impact on a person's health condition. Various efforts have been made to prevent the incidence of hypertension, but have not been significantly successful because there were still many factors that triggerred each other to develop hypertension (multifactorial). This study aims to analyze the correlation between socio-economic factors and stress with hypertension cases during the Covid-19 pandemic at Sikumana CHC.

METHOD

This was an analytical observational study with a case-control approach[7]. This study was conducted in the work area of Sikumana CHC, Kupang City, Maulafa Sub-District. This study was conducted from July to August 2022. The study population involved patients with hypertension recorded in the register book of Sikumana CHC in 2021 to May 2022, aged 30 years and over as many as 185 people. The samples in two study groups had a ratio of 1:1 consisting of 42 respondents, respectively. This study applied a probability sampling technique, namely simple random sampling, which was performed by recording the identity of patients with hypertension from 2021 to May 2022 who were then determined through the assistance of the Ms.excel program using the formula of =RANDBETWEEN. The independent variable in this study was socio-economic factors which consisted of income level. In terms of socio-economic status, income in a certain community group is determined based on the Regional Minimum Wage (UMR) and whether there is social assistance from the government/private sector. In this study, high category income referred to income of >UMR in 2022 (Rp. 2,039,500) and did not receive pre-prosperous family social assistance from the government/private sector. On the other hand, low category of income referred to income of ≤ UMR in 2022 (Rp. 2,039,500) and/or had a pre-prosperous family card (recipient of social assistance). Employment status was determined based on the activities carried out by respondents to earn regular income, both permanent and non-permanent work with the category of employed (had regular income from permanent or non-permanent work), and the category of unemployed (did not have a permanent and not permanent work and had no regular income).

The level of education was determined based on the last formal education taken by respondents that was supported by a graduation certificate, with the category of high education (SHS/VHS,Diploma/Bachelor/Masters/Specialist/Doctorate), and low education category (no formal education, dropped out of school, Elementary/JHS). The stress condition was assessed based on the categories of mild, moderate, severe and very severe conditions. Normal and mild stress conditions were included in no stress category, and moderate,

severe and very severe stress conditions were included in stress category. The dependent variable in this study was hypertension, which was assessed based on level of blood pressure of ≥ 120/80 mmHg, as diagnosed by a healthcare worker in the medical record. Respondents with hypertension were involved in the case group, and vice versa, respondents without hypertension were involved in the control group. Data were collected using Depression Anxiety Stress Scales (DASS 42) questionnaire as an instrument to assess the level of stress experienced by respondents[8]. Data were processed using software and analyzed using the Chi Square test with a 95% confidence level (alpha=0.05). Furthermore the OR value was calculated based on the Confidence Intervals=95% [9]. This study has obtained ethical approval issued by the Health Research Ethics Commission, Faculty of Public Health, Nusa Cendana University Number: 2022198-KEPK.

Table 1. Frequency Distribution of Characteristics of Respondents.

Characteristic of Respondent	Category	Group				Total	
		Case		Control			
		n	%	n	%	n	%
Age	30-34 years	2	4.8	8	19.0	10	11.9
	35-39 years	3	7.1	10	238	13	15.5
	40-44 years	3	7.1	10	23.8	13	15.5
	45-49 years	9	21.4	5	11.9	14	16.7
	50-54 years	8	19.0	2	4.8	10	11.9
	55-58 years	17	40.5	7	16.7	24	28.6
Residence	Oepura Village	9	21.4	8	19.0	17	20.2
	Sikumana Village	10	23.8	8	19.0	18	21.4
	Naikolan Village	4	9.5	10	23.8	14	16.7
	Kolhua Village	4	9.5	1	2.4	5	6.0
	Bello Village	8	19.0	8	19.0	16	19.0
	Fatukoa Village	7	16.7	7	16.7	14	16.7
Number of Family Members	> 4 people	28	66.7	29	69.0	57	67.9
	≤ 4 people	14	33.3	13	31.0	27	32.1
Gender	Male	16	38.1	13	31.0	29	34.5
	Female	26	61.9	29	69.0	55	65.5

Regarding the age group, most of respondents in the case group were at the age group of 55-58 years as many as 17 people (40.5%). On the other hand, most of respondents in the control group were at the age groups of 35-39 and 40-44 years 55-58 years, as many as 10 people (23.8%), respectively. Regarding residence, most of respondents in the case group lived in Sikumana Village, as many as 10 people (23.8%) and most of respondents in the control group lived in Naikolan Village, as many as 10 people (23.8%). Furthermore regarding the number of family members, most of respondents in the case group had >4 family members, as many as 28 people (66.7%) and most of respondents in the control group had >4 family members, as many as 29 people (69.0%). Regarding gender, most of respondents in the case group were female, as many as 26 people (61.9%) and most of respondents in the control group were female, as many as 29 people (69.0%).

Table 2. Correlation between Income, Occupation, Education and Stress with Hypertension Cases at Sikumana CHC.

Variable	Hypertension				p-value	OR	CI (95%)
	Case		Control				
	n	%	n	%			
Income							
Low	29	69.0	17	40.5	0.016	3.21	1.33-8.05
High	13	31.0	25	59.5			
Employment Status							
Employed	28	66.7	17	40.5	0.029	2.94	1.20-7.15
Unemployed	14	33.3	25	59.5			

Variable	Hypertension				p-value	OR	CI (95%)
	Case		Control				
	n	%	n	%			
Level of Education							
Low	30	71.4	16	38.1	0.004	4.06	1.62-10.13
High	12	28.6	26	61.9			
Stress Condition							
Stress	33	78.6	13	31.0	0.000	8.17	3.05-21.91
No Stres	9	21.4	29	69.0			

Based on the results of bivariate analysis, there was a correlation between income and hypertension (p-value=0.016). Respondents who had low income were at risk of 3.21 times greater for experiencing high blood pressure (95% CI 1.33-8.05) compared to respondents who had high income. Furthermore, there was a correlation between employment status and hypertension (p-value=0.029). Respondents who were unemployed had a 2.94 times greater risk of experiencing high blood pressure (95% CI 1.20-7.15) compared to respondents who were employed. There was a correlation between level of education and hypertension (p-value=0.004). Respondents with low education had a 4.06 times greater risk of experiencing high blood pressure (95% CI 1.62-10.13) compared to respondents who had higher education. In addition, there was a correlation between stress and hypertension (p-value=0.000). Respondents who experienced stressful conditions were 8.17 times more likely to experience high blood pressure (95% CI 3.05-21.91) compared to respondents who did not experience stressful conditions.

DISCUSSION

The number of people with hypertension continues to increase every year, and it is predicted that many people will die from hypertension and its complications[3]. There are many influential factors for hypertension which consist of changeable factors and unchangeable factors[10].

Income is a risk factor for the incidence of hypertension[11]. Income level is related to the amount of income a person earns[11]. The low income earned by a person can affect his or her consumption patterns and lifestyle towards disease. The low income earned by respondents showed an impact on poor diversity of food consumed, both in terms of protein, carbohydrates, fat, fiber, minerals and vitamins. Respondents' income was only sufficient to meet basic needs such as children's school fees, electricity, water and rental cost which were considered more important than consuming good food which was able to control blood pressure as well as performing health checks at health facilities[12]. This finding is supported by a study conducted in Yogyakarta City which showed that there was a correlation between low income and hypertension[13].

A person's work or livelihood determines the amount of the income earned. Furthermore, type of work or livelihood is determined by one's education, the better one's work or livelihood, the greater the community appreciation, meaning that one’s social and economic status in society can be directly defined based on his work or livelihood[14] The study findings indicated that work was a risk factor for hypertension. Most of respondents in the study were unemployed because most of the respondents experienced the impact of the Covid-19 pandemic and lost their jobs temporarily. Most of the jobs held by the respondents were temporary, such as self-employed, drivers, fishermen, laborers and entrepreneurs. Work is very closely related to the level of income, which will affect family welfare related to fulfillment of household needs, both primary and secondary needs. The better fulfillment of primary and secondary needs in the family will affect the respondents’ health status. In other words, respondents might have good purchasing power in meeting good and varied food intake and could access various good health services as well. On the other hand, unfulfilled primary and secondary needs will lead to poor purchasing power which will lead to a decline in health status, since the needs of good and varied food intake could not been pfulfilled and there is a lack of access to various health services[15].

Previous study showed that there was a correlation between employment status and hypertension at Makrayu Ilir Barat II CHC, Palembang. In addition, employment status also

had a strong correlation with socio-economic status. Diseases that occurred in the family were often associated with the type of work which affected family income[16].

Low level of education tends to inhibit attitudes in receiving various information which will be proven by the presence or absence of changes in behavior[17]. On the other hand, the higher a person's education, the better the level of knowledge, information and quality of human resources. The level of education is an influential factor for hypertension. A person with a high level of education is considered able to obtain information and manage it before it becomes a good or bad behavior that affects his or her health status[11]. The study findings indicated that most uneducated people had high blood pressure. A low level of education will affect the perception of antihypertensive behavior. In other words, the more someone knows about factors, signs and symptoms, as well as normal and abnormal blood pressure, the more likely he is to avoid behaviors that can cause hypertension, such as: smoking, drinking coffee, lack of physical activity and consumption of fatty foods. The study finding is in line with a study conducted in Yogyakarta City which showed a correlation between education and hypertension[13].

Stress occurs because of the gap between expectations and reality[18]. Stress condition experienced by each person can be different in terms of how to respond and overcome it. Such difference may exist since stress is subjective and personal matter[19]. The results of interviews with respondents revealed that stress experienced by respondents occurred due to daily activities in the family, work environment, social environment, socio-economic conditions, and health status. Those factors are coupled with the Covid-19 pandemic situation which has made changes in lifestyle and routines such as a decrease in the quality of food consumed, utilization of health facilities and difficulty in concentrating which resulted on a decrease in body immunity of respondents As a result, there were psychological responses from the respondent in the form of easily irritated and angry, difficult to rest every night, easily agitated, anxious, and difficulty in getting time to relax. In addition there was a physiological response of an increase in blood pressure[20].

The physiological response experienced by the respondents will affect their health condition. If this is experienced by the respondents in a prolonged period of time it will make blood pressure to be constant and get higher[21]. Stress can cause activation of the sympathetic nerves, which further increases the release of norepinephrine from the sympathetic nerves in the heart and blood vessels, resulting in increased cardiac output and increased systemic vascular resistance. Excretion by the adrenal medulla causes excess hormones to be released into the bloodstream, which produce a response to physical and emotional stress. The presence of sympathetic nerve activity can increase circulating angiotensin II, aldosterone, and vasopressin, which can increase systemic vascular resistance. Prolonged increases in angiotensin II and catecholamine may lead to enlargement of the heart and blood vessels, both of which can contribute to persistent increase in blood pressure as the cause of hypertension[22].

Previous study conducted at Medan City Regional General Hospital showed that there was a correlation between stress and hypertension. Stress affects a person's health since it can increase blood pressure intermittently (not permanently). The presence of sympathetic nerve activity will cause a gradual increase in blood pressure. Prolonged stress can cause stabilization or increase in blood pressure[21].

CONCLUSION

Income, Employment Status, and Stress were risk factors for someone to experience hypertension. Respondents need to respond actively to every direction given by healthcare workers to maintain health status properly by adopting various food consumption pattern, and maintaining their psychological condition during the Covid-19 pandemic. The CHC should increase health promotion and add various media by utilizing electronic media as an effort to educate the public regarding various food consumption pattern, as well as paying attention to types of work and stress management during the Covid-19 pandemic.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

REFERENCE

1. Kemenkes RI. Profil Kesehatan Indonesia 2019 [Internet]. Kementrian Kesehatan Republik Indonesia. Kementerian Kesehatan Republik Indonesia; 2020. 487 p. Available from: https://www.kemkes.go.id/downloads/resources/download/pusdatin/profil-kesehatan-indonesia/Profil-Kesehatan-Indonesia-2019.pdf
2. Anggia V, Wiyati T, Wulandari N. Pembuatan Nutrisi dan Penyuluhan Penyakit Hipertensi pada Anggota PKK Delima Jakarta Timur. J SOLMA [Internet]. 2019;8(1):1. Available from: journal.uhamka.ac.id/index.php/solma/article/view/3059/954
3. World Health Organization. More than 700 million people with untreated hypertension. In: Hypertension [Internet]. 2019. Available from: https://www.who.int/news/item/25-08-2021-more-than-700-million-people-with-untreated-hypertension
4. Kemenkes RI. Hari Hipertensi Dunia 2019 : "Know Your Number, Kendalikan Tekanan Darahmu dengan CERDIK.". [Internet]. P2PTM Kemenkes RI. 2019. Available from: http://p2ptm.kemkes.go.id/subdit-penyakit-kanker-dan-kelainan-darah/hari-hipertensi-dunia-2019-know-your-number-kendalikan-tekanan-darahmu-dengan-cerdik
5. Riskesdas. Hasil Utama Riset Kesehatan Dasar. Kementrian Kesehat Republik Indones [Internet]. 2018;1–100. Available from: https://kesmas.kemkes.go.id/assets/upload/dir_519d41d8cd98f00/files/Hasil-riskesdas-2018_1274.pdf
6. Notoatmodjo S. Kesehatan Masyarakat Ilmu dan Seni. Revisi 201. Jakarta: Rineka Cipta; 2011. 413 p.
7. Masturoh I, Nauri A. Metodologi Penelitian Kesehatan [Internet]. Kementerian Kesahatan RI. 2018. p. 307. Available from: http://bppsdmk.kemkes.go.id/pusdiksdmk/wp-content/uploads/2018/09/Metodologi-Penelitian-Kesehatan_SC.pdf
8. Marsidi SR. Identification of Stress, Anxiety, and Depression Levels of Students in Preparation for the Exit Exam Competency Test. J Vocat Heal Stud. 2021;5(2):87.
9. Kleinbaum G.David KM. Logistic Regression: A Self Learning Text (3rd ed). New York: Springer; 2010.
10. Kemenkes RI. Faktor Risiko Hipertensi. 2018; Available from: https://p2ptm.kemkes.go.id/infographic-p2ptm/hipertensi-penyakit-jantung-dan-pembuluh-darah/faktor-risiko-hipertensi
11. Rismadi K. Pengaruh faktor sosial dan gaya hidup terhadap kejadian hipertensi pada nelayan di kota medan tesis [Internet]. Unviversitas Sumatera Utara; 2021. Available from: https://repositori.usu.ac.id/handle/123456789/32776
12. Lestari YI, Nugroho PS. Hubungan Tingkat Ekonomi dan Jenis Pekerjaan dengan Kejadian Hipertensi di Wilayah Kerja Puskesmas. Borneo Student Researh. 2019;269–73.
13. Ningsih D. Faktor-Faktor Yang Berhubungan Dengan Kejadian Hipertensi Pada Pekerja Sektor Informal Di Pasar Beringharjo Kota Yogyakarta. Naskah Publ [Internet]. 2017;1–20. Available from: http://digilib.unisayogya.ac.id/2689/1/1610104364_Dwi Lestari_Naspub.pdf
14. Pinem M. Pengaruh pendidikan dan status sosial ekonomi kepala keluarga bagi kesehatan lingkungan masyarakat. JPPUMA J Ilmu Pemerintah dan Sos Polit UMA (Journal Gov Polit Soc UMA) [Internet]. 2016;4(1):97–106. Available from: http://ojs.uma.ac.id/index.php/jppuma
15. Hanum N, Safuridar S. Analisis Kondisi Sosial Ekonomi Keluarga terhadap Kesejahteraan Keluarga di Gampong Karang Anyar Kota Langsa. J Samudra Ekon dan Bisnis. 2018;9(1):42–9.
16. Azhari MH. Faktor-Faktor yang Berhubungan dengan Kejadian Hipertensi di Puskesmas Makrayu Kecamatan Ilir Barat II Palembang. J Aisyah J Ilmu Kesehat [Internet]. 2017;2(1):23–30. Available from: https://aisyah.journalpress.id/index.php/jika/article/view/MHA

17. Maulidina F, Harmani N, Suraya I, Studi P, Masyarakat K, Bekasi PJ, et al. Faktor-Faktor yang Berhubungan dengan Kejadian Hipertensi di Wilayah Kerja Puskesmas Jati Luhur Bekasi Tahun 2018 Factors Associated with Hypertension in The Working Area Health Center of Jati Luhur Bekasi 2018. Arkesmas [Internet]. 2019;4(July):149–55. Available from: https://journal.uhamka.ac.id/index.php/arkesmas/article/view/3141
18. Gunawan SP, Adriani M. Obesitas Dan Tingkat Stres Berhubungan Dengan Hipertensi Pada Orang Dewasa Di Kelurahan Klampis Ngasem, Surabaya. Media Gizi Indones [Internet]. 2020;15(2):p123. Available from: https://e-journal.unair.ac.id/MGI/article/view/14026
19. Muslim M. Moh . Muslim : Manajemen Stress pada Masa Pandemi Covid-19 ” 193. J Manaj Bisnis [Internet]. 2020;23(2):192–201. Available from: https://ibn.e-journal.id/index.php/ESENSI/article/view/205
20. Loa WW, Nabuasa E, Sir AB. Hubungan Antara Berat Badan, Diet, Aktivitas Fisik Dan Tingkat Stres Dengan Gangguan Siklus Menstruasi (Studi Pada Mahasiswi Fakultas Kedokteran, Universitas Nusa Cendana). Media Kesehat Masy [Internet]. 2022;4(1):34–43. Available from: https://doi.org/10.35508/mkmhttps://ejurnal.undana.ac.id/MKM
21. Rita S. Faktor yang Mempengaruhi Hipertensi di RSUD DR.RM. Djoelham Kota Binjai. J Publ Kesehat Masy Indones [Internet]. 2017;4(3):108–14. Available from: https://ppjp.ulm.ac.id/journal/index.php/JPKMI/article/view/4323#:~:text=Berdasarkan hasil penelitian dapat disimpulkan,RM. Djoelham Kota Binjai.
22. Awaliyah R. Hubungan Antara Tingkat Stres Dengan Kejadian Hipertensi Pada Usia Produktif Di Klinik Gracia Ungaran Kabupaten Semarang. Univ Ngudi Waluyo Semarang [Internet]. Journal Information, 2020:1–133. Available from: http://repository2.unw.ac.id/636/