

Relationship between Lifestyle and Stress Levels in Hypertension Patients

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ABSTRACT

Hypertension is a disease that often occurs with increasing age. Hypertension can be influenced by lifestyle factors and stress. This study aims to see the relationship between lifestyle and stress levels in hypertensive patients. The research method used a cross-sectional design with 70 samples in hypertensive patients at KRMT Wongsonegoro Hospital Semarang. Data were collected using a questionnaire. Data analysis used the Spearman rank correlation test to determine how the two variables relate. The results showed a significant relationship between lifestyle and stress levels in hypertensive patients ($r = - 0.263$, $p < 0.028$). In this study, there were respondents whose unhealthy lifestyles tended to cause blood pressure to rise, causing stress.

INTRODUCTION

Hypertension is a disease that often occurs in society and this disease is not contagious. (Ayu Puspita Sari, Feriana, 2023). Hypertension is a systolic blood pressure of more than 140 mmHg and a diastolic blood pressure of more than 90 mmHg checked twice within a five-minute interval in a calm state. There are two factors, namely internal factors caused by genetics (age, race, stress and gender) and external factors caused by the environment such as smoking habits, alcohol, and lack of activity. The Situation (2020). Hypertension is a non-communicable disease but is a very serious health problem. Uncontrolled hypertension can lead to stroke, congestive heart disease, and heart attack (Imelda et al., 2020).

The significant global prevalence of high blood pressure among individuals aged 30-79 years, is around 1.28 billion people. The majority of cases, around two-thirds, are concentrated in countries with low and middle income levels. Surprisingly, an estimated 46% of those affected are unaware of their condition. This number is projected to continue to increase to 1.5 billion cases by 2025. In addition, the number of deaths due to high blood pressure and its complications is estimated to reach 9.4 million people. In Indonesia, according to the Basic Health Research conducted in 2018, the prevalence of hypertension reached 34.1%, an alarming 25.8% increase since 2013, it is estimated that only one-third of the Indonesian population is diagnosed with hypertension, leaving the remaining two-thirds undiagnosed. Based on statistics provided by the Central Java Provincial Health Office, it turns out that Semarang City has the highest incidence of hypertension cases, namely 67,101 cases (19.56%) of the total cases in the entire Central Java province. If we look at the total number of cases of high blood pressure in Semarang City alone, the proportion is even greater, namely 53.69%. (Fatmasari, 2021). In addition, data from the Sirandu website managed by the Semarang City Health Office states that from January 1, 2021 to July 15, 2021, a total of 61,950 people were diagnosed with hypertension. In particular, Gayamsari Regency has the highest number of cases, with a total of 4,089 people affected. (Semarang, 2021). Hypertension is a long-term disease, one of the factors that causes hypertension is genetic factors, lifestyle behavior, stress levels. (Dharmawan & Hermanto, 2023).

Lifestyle behavior is the way they live and interact in the world by expressing themselves in their activities, interests, and opinions. Human lifestyle includes various aspects, including sleeping habits, eating habits, exercising regularly, and the ability to manage stress when someone spends time outside the home. But today's lifestyle is more sedentary and prefers foods that contain salt. Hypertension is a disease that is included as a silent killer is a term often given to hypertension because the death caused by it does not have visible signs and symptoms. (Dharmawan & Hermanto, 2023). One way to improve patient knowledge about good and correct lifestyle management for hypertension is to provide health education. (Ayu Puspita Sari, Feriana, 2023).

Environmental changes that challenge or threaten individuals can increase stress levels. Excessive stress can cause hypertension. Stress is caused by the surrounding environment and the individual's appearance in it, which can cause pressure, change, and emotional tension. (Mira Octavia Lingga, 2023).

Based on the existing problem phenomena and the gap in previous research results, a study was conducted with the title "The Relationship between Lifestyle and Stress Levels in Hypertension Patients at KRMT Wongsonegoro Regional Hospital, Semarang".

This study was conducted at RSUD KRMT Wongsonegoro Semarang, with a total sample of 70 respondents in hypertensive patients. The purpose of this study was to determine whether there is a relationship between lifestyle and stress levels in hypertensive patients, so that it can be used to help the nursing profession in providing nursing interventions, especially regarding the relationship between lifestyle and stress levels in hypertensive patients. In addition, it is hoped that this study will be beneficial for the community, so that they can know a good and correct lifestyle, control high blood pressure and control stress so that it is not excessive.

THEORETICAL REVIEW

Definition of Hypertension

Hypertension is a medical condition related to a person's blood pressure. Hypertension is a systolic blood pressure of more than 140 mmHg and a diastolic blood pressure of more than 90 mmHg taken twice with a five-minute interval in a calm state.(Pratiwi, 2020). Hypertension is a disease that can cause death.(Situmorang, 2020). Uncontrolled hypertension can increase the risk of stroke, congestive heart disease, and heart attack.(Imelda et al., 2020).

Definition of Lifestyle

Lifestyle is how a person spends their time with activities, interests, and things they consider important in their environment.(Ancient, 2021). Lifestyle is one of the most important factors that can influence life in society, especially among the elderly.(Ayu Puspita Sari, Feriana, 2023). There are two lifestyle factors that cause hypertension, namely genetic factors, factors that cannot be controlled, including age, race, and gender. While lifestyle factors that can be controlled are by living a healthy lifestyle. Unhealthy lifestyles include lack of physical activity, eating excessive fatty and salty foods, drinking drinks containing caffeine, smoking, stress(Raziansyah & Ridha Amalia, 2022).

Definition of Stress Level

Stress is a physiological and psychological reaction to a person's efforts to adapt and control internal and external stimuli. At the age of 15 to 64 years, people most often experience stress.(Hidayatunnafi'ah, 2023). Stress can be caused by the demands of life, both those influenced by the environment and the individual's appearance in it. Stress reactions in the body can cause pressure, change, and emotional tension.(Awaliyah, 2020). The relationship between stress and hypertension can increase blood pressure through the sympathetic nerves. If stress lasts for a long time, blood pressure can rise, and the body will try to adjust itself, causing abnormalities or pathological changes.(Subakti, 2019).

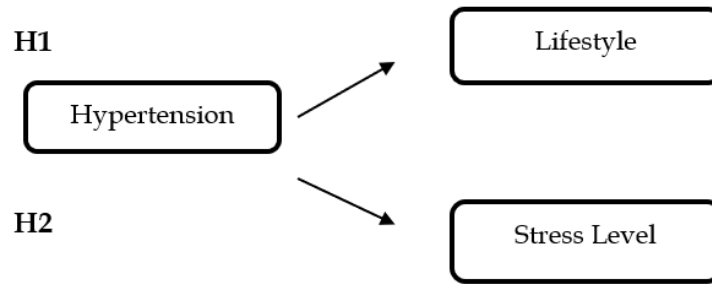


Figure 1. Conceptual Framework

METHODOLOGY

This study uses a quantitative correlational approach to find the relationship between lifestyle and stress levels. This study uses the Cross-Sectional method where data for the dependent variable and independent variables are collected and observed simultaneously. This study uses a sample using quota sampling with 70 respondents in hypertensive patients. The inclusion criteria include hypertensive patients aged 30-79 years, for the exclusion criteria include patients with mental disorders, patients with hearing disorders, patients with complications of stroke for research. Data collection using a questionnaire, researchers apply the Spearman rank correlation test method. This study has obtained ethical clearance from the Ethics Committee of the KRMT Wongsonegoro Hospital, Semarang City with the number 043 / Kom.EtikRSWN / V / 2024.

RESULTS

1. Respondent Characteristics

It can be explained that the highest proportion of gender in this study is Women as many as 40 respondents (57.1%). The highest proportion of age level is pre-elderly (46-59 years) as many as 26 respondents (37.1%). The highest proportion of education level is at elementary school level as many as 25 respondents (35.6%). The highest proportion of employment level as many as 26 respondents (37.1%) from the characteristics of IRT (Housewife).

Table 1. General Data Characteristics of Respondents

Characteristics	Amount	%
1 Gender		
Man	30	42.9
Woman	40	57.1
2 Age		
>26 – 45 years	18	25.7
46 – 59 years	26	37.1
60 – 69 years	20	28.6
70 – 89 years	6	8.6
3 Education		
SD	25	35.6
JUNIOR HIGH SCHOOL	12	17.1
SMAS1/D3	22	31.4
	11	15.7
4 Work		
Doesn't work	11	15.7
Private	11	15.7
Self-employed	17	24.3
civil servant	1	1.4
Laborer	4	5.7
Housewife	26	37.1

2. Lifestyle

Of the total 70 respondents, 43 respondents (61.5%) had a bad lifestyle, while 27 respondents (38.5%) had a good lifestyle. The details are presented in table 2.

Table 2. Lifestyle of Respondents

Lifestyle	Frequency (n)	Percentage (%)
Good	27	38.5%
Not good	43	61.5%
Total	70	100.0

3. Stress Level

Of the total 70 respondents, 29 respondents (41.4%) experienced moderate levels of stress, and 21 respondents (30%) experienced severe levels of stress, while 20 respondents (28.6%) experienced mild levels of stress.

Table 3. Stress Levels in Respondents

Stress Level	Frequency	Percentage (%)
Light	20	28.6
Currently	29	41.4
Heavy	21	30
Total	70	100.0

4. Relationship between Lifestyle and Stress Levels

The cross tabulation results showed a correlation between lifestyle and stress levels showing a total of 70 respondents, 43 respondents (61.5%) had a bad lifestyle, 10 respondents (14.5%) experienced mild stress, 22 respondents (31.5%) experienced moderate stress, 11 people (16%) experienced severe stress. While 27 respondents (38.5%) had a good lifestyle, 10 respondents (14.5%) experienced mild stress, 7 respondents (9%) experienced moderate stress, and 10 respondents (14.5%) experienced severe stress.

The data is strengthened by statistical tests with the Spearman rank test (Spearman Rho) which is used to determine the level of closeness of the relationship between two ordinal scale variables. With the results of the Rho value = -0.263 and the p value = 0.028 (<0.05) obtained, the hypothesis taken Ho is rejected, Ha is accepted, so it shows that there is a Relationship between Lifestyle and Stress Levels in Hypertension Patients at KRMT Wongsonegoro Hospital, Semarang. With the criteria for the level of relationship (correlation coefficient) with a value (rho = -0.263) which has a low level of relationship meaning a negative direction, meaning that the lower the patient experiences a lifestyle, the higher the level of stress experienced by hypertension patients at KRMT Wongsonegoro Hospital, Semarang.

Table 4. Relationship between Lifestyle and Stress Levels

Lifestyle	Stress Level						Total	rho	P Value
	Light		Currently		Heavy				
	n	%	n	%	n	%	n	%	
Not good	10	14.5	22	31	11	16	43	61.5	-0.263 0.028
Good	10	14.5	7	9	10	14.5	27	38.5	
Total	20	29	29	40.5	21	30.5	70	100.0	

DISCUSSION

1. Respondent characteristics

a. Gender

It was obtained from the research conducted that there were 70 research subjects, of which 40 respondents (57.1%) were female and 30 respondents (42.9%) were male. In the research ((2023) that most hypertension sufferers are women, because women are more likely to suffer from hypertension than men. Blood pressure increases because estrogen in women decreases during menopause. Based on the results of the study (Alifariki, 2019) Hypertension is more common in women than in men. It is possible that the female hormone estrogen causes higher hypertension in women than in men. Women are at higher risk of developing hypertension after reaching menopause, which usually occurs after 45 years. Estrogen helps women before menopause increase their high-density lipoprotein (HDL) cholesterol levels. Based on research ((Sugiyanto & Husain, 2022) explains that most

hypertension sufferers are women compared to men. Explains that women are more susceptible to stress, and biological changes, especially hormonal. Women who are older than men will experience decreased self-confidence, interpersonal disorders, and family problems.

b. Age

The age distribution of respondents in this study showed interesting variations. The most dominant age group was 46-59 years old, with 26 respondents (37.1%) from a total sample of 70 respondents. In the study ((2019)that there is the age >40 years most in hypertension sufferers. This is because increasing age can increase the risk of hypertension. The results of the study (Nuraeni, 2019)shows that age >45 years is at higher risk of hypertension compared to age <45 years. This increased risk can be associated with the natural aging process, which leads to enlargement and hardening of blood vessels, reducing their capacity to accommodate blood flow. As a result, systolic pressure increases. Aging factors collectively trigger vasoconstriction, increased vascular resistance, and ultimately cause increased blood pressure. Based on the results of the study (Lumintang et al, 2023)that there are most people with hypertension aged >40 years. With increasing age, blood vessels become less elastic so that they can contribute to increased blood pressure.

c. Education

In this study, the results of the characteristics based on education level producedthat the majority of education, 35% of the 25 respondents diagnosed with hypertension, were only graduatesSD. Based on the research results ((Irawan & Suhartini, 2023)shows the results that most with elementary school education in hypertension patients. The level of education directly affects a person's level of knowledge. A person with a high level of knowledge tends to show positive behavior related to health, while a person with a low level of education can usually only remember, describe, define, and state information without showing understanding, application, analysis, and evaluation of the abilities they have. The results of the study (Pebrisiana et al, 2022)shows the results that most of the patients with hypertension have low levels of education. One of the factors that influences daily lifestyle is the level of education. People who are less educated tend not to know much about health needs. In the study (Goddess, 2022)shows that there are informants with limited knowledge of hypertension sufferers. This means that education has a great impact on health because a person's knowledge of their health is broader.

d. Work

In this study, the results of the characteristics are based on the level of employment. that the majority of hypertension sufferers are individuals with the employment status of Housewife (IRT), namely 37.1% with a total of 26 respondents. In the study (Nabila et al, 2022) revealed that most informants who suffer from hypertension are housewives (IRT). Due to lack of activity or not working tends to cause severe hypertension which causes stress. The results of the study (Massa & Manafe, 2022) that there is the most type of work being a housewife (IRT) in hypertension sufferers. The type of work of a person also affects hypertension, because if someone does less activity, it will make them bored and cause stress because they only stay at home. Based on the results of the study ((Sutrisno & Alfiani, 2024) shows the results that most hypertension patients do not work. So respondents who do not have activities and do not exercise enough are more likely to suffer from hypertension because it can cause blood pressure to rise.

2. Lifestyle

Analysis of 70 respondents in this study obtained the results obtained 43 respondents (61.5%) have a bad lifestyle, while 27 respondents (38.5%) have a good lifestyle. In line with research ((2019) revealed that there were respondents who had bad lifestyle habits in hypertension patients, including having excessive smoking habits, not exercising, eating fatty foods (fried foods, meat, coconut milk) and liking foods that taste salty. Bad lifestyle habits are one of the causes of high blood pressure. If blood pressure is not controlled, it can cause cardiovascular disease. Based on the results of the study (Indartati Marhamah, 2024) shows that there is an unhealthy lifestyle in hypertension sufferers, this is due to lack of activity, eating meat more than 3 times a week, eating fried foods almost every day and smoking excessively. This is one of the causes of high blood pressure. In the study (Wijaya et al., 2020) revealed that there is a bad lifestyle in hypertension sufferers. Respondents have bad activities, have a habit of smoking, drinking alcohol, eating fatty foods, salty, and liking instant foods. Instant foods can also increase blood pressure. Increased levels in the body, in cholesterol that increases due to increased body weight, so that blood volume increases due to excessive fat consumption. Excessive smoking habits are not good, because cigarettes contain chemicals that can be harmful to health, smoking can also cause hypertension, because the arteries narrow, making the heart work harder, resulting in increased blood pressure.

3. Stress Level

The results of the study on 70 respondents in this study obtained 29 respondents (41.5%) experiencing moderate stress, 21 respondents (30%) experiencing severe stress, and 20 respondents (28.5%) experiencing mild stress. In line with the study (Hidayatunnafi'ah, 2023) in this study showed that hypertension sufferers experience mild to severe stress, this is because respondents have a lot of external pressure that causes stress. Stress is one of

the causes of high blood pressure, if high blood pressure is not controlled it can cause complications. This is because respondents consider hypertension to be a normal thing. Respondents also did not experience significant physiological changes such as headaches, nosebleeds, and dizziness. The results of the study ((Najmi Putri Wijanarko, 2024) revealed that hypertensive patients experienced the highest levels of stress. Respondents when experiencing problems, these problems become excessive thoughts, so that excessive thoughts cause stress. Based on research(Sugiyanto & Husain, 2022)There are 53.2% of respondents experiencing stress in hypertension patients. The study showed that respondents who experience stress, feel more easily angry and annoyed because of small things, easily offended, impatient and have difficulty calming down.

4. Relationship between Lifestyle and Stress Levels

The results obtained from the study using analysis carried out with the Spearman rank statistical test between the variables "Lifestyle" and "Stress Level" obtained a value (p-value) of 0.028 or P-value $< \alpha$ (0.05) which states that there is a significant correlation between lifestyle and stress levels. In the study ((2023)in showing that there is a relationship between lifestyle and stress levels in the occurrence of hypertension, this is because respondents have a bad lifestyle, respondents have a habit of eating fatty foods such as eating fried foods almost every day, eating meat more than 4 times a week, like food with coconut milk, and like to eat high salt, rarely do activities. Such a lifestyle can cause blood pressure to rise, causing stress. Based on research(Ayu Puspita Sari, Feriana, 2023)shows that there is a relationship between lifestyle and stress in hypertensive patients. This is because someone rarely exercises, likes high-sodium foods, eats fatty foods, coconut milk more than 3 times a week, drinks coffee almost every day, smokes excessively and is stressed. Hypertension can be caused by excessive stress, to avoid diseases that cause complications, it is advisable to regulate a healthy lifestyle and be able to control stress so that it is not excessive. Research results(Arifin et al., 2020)that there is a relationship between lifestyle and diet with the incidence of hypertension. This is because people with hypertension have a habit of eating foods high in salt, eating less fruit and vegetables, which causes blood pressure to rise. Poor diet can reduce the diameter of the arteries so that the heart pumps blood more strongly, this is what can affect increased blood pressure. To prevent blood pressure levels, it is necessary to know foods that can cause blood pressure. Based on research(Tyas & Zulfikar, 2021)There is a relationship between stress levels and blood pressure levels in the elderly. This is because respondents are easily angry and offended by small things, so overthinking can cause blood pressure to rise. Stress can trigger hormones in the body, so that blood pressure increases.

CONCLUSION AND RECOMMENDATIONS

Based on the discussion on "The Relationship between Lifestyle and Stress Levels in Hypertension Patients" the researcher concluded that:

1. Respondent characteristics gender mostly female. majority age 46-59 years old including early elderly category, majority education elementary school, majority occupation as housewife, most have bad lifestyle, majority experience moderate stress level.
2. The results of the Spearman rank test showed that the stress level and lifestyle of hypertension sufferers were found to be significantly correlated. This study revealed a strong correlation between lifestyle and stress levels. Data analysis shows that: patients with poor lifestyles tend to have high stress levels, which can create a negative cycle that can cause blood pressure to rise.

FURTHER STUDY

It is expected to develop this study and deepen the lifestyle and stress levels in hypertensive patients that are not carried out at one time. Then this study can also be carried out with a qualitative method, so that informants can tell more clearly. It is possible that in the future a study can provide new results and views that are different from this study.

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REFERENCE

- Alifariki. (2019). Epidemiology of Hypertension. https://books.google.co.id/books?hl=id&lr=&id=PlSqDwAAQBAJ&oi=fnd&pg=PP1&dq=alifariki+2019+epidemiologi+hipertensi&ots=3uNYF_Ih8h&sig=TSOVAaO1CNV_uuuK8g00dN_pWTI&redir_esc=y#v=onepage&q=alifariki+2019+epidemiology+of+hypertension&f=false
- Arifin, B., Zaenal, S., & Irmayani. (2020). Relationship between Lifestyle and Hypertension Incidence at Sabutung Health Center, Pangkep Regency. *Scientific Journal of Health Diagnosis*, 15(3).
- Ayu Puspita sari, Feriana, N. (2023). The Relationship Between Lifestyle and Stress with the Incidence of Hypertension in the Elderly. *Professional Health Journal*, 4(2), 111-125.
- Dewi, N. (2022). Relationship between Knowledge Level and Lifestyle with Hypertension Incidence. https://d1wqtxts1xzle7.cloudfront.net/105018291/pdf-libre.pdf?1692101344=&response-content-disposition=inline%3B+filename%3DHiabangan_Tingkat_Pengetahuan_da_n_Gaya_Hi.pdf&Expires=1720681493&Signature=EJLLOesJEjl7m14~11GoONfXCPW74cLsuZITU30Hq0wpFtH5Dze7rE2S
- Dharmawan, R., & Hermanto, YP (2023). Pastoral Counseling for Congregations Suffering from Hypertension Due to Unhealthy Lifestyles. *CARAKA*:

- Journal of Biblical Theology and Practice, 4(2), 341–356.
<https://doi.org/10.46348/car.v4i2.183>
- Fatmasari, AP (2021). Demographic Characteristics Related to Complications in Hypertension Patients in Semarang City. *VISIQUES: Journal of Public Health*, 20(2). <https://doi.org/10.33633/visikes.v20i2.4999>
- Hidayatunnafi'ah, DA (2023). Relationship between Lifestyle and Stress Levels with Hypertension Incidence in Productive Age. *Bakti Tunas Husada Health Journal: Journal of Nursing Sciences, Health Analysis and Pharmacy*, 76, 66. http://wisuda.unissula.ac.id/app/webroot/img/library/detail85/IlmuKeperawatan_30901900060_fullpdf.pdf#
- Imelda, I., Sjaaf, F., & Puspita, T. (2020). Factors Associated with the Incidence of Hypertension in the Elderly at the Air Dingin Lubuk Minturun Health Center. *Health & Medical Journal*, 2(2), 68–77. <https://doi.org/10.33854/heme.v2i2.532>
- Indartati Marhamah. (2024). The relationship between lifestyle and increased blood pressure in hypertension patients at the Datar City Health Center. 2022, 22–26.
- Irawan, D., & Suhartini, T. (2023). Relationship between Stress Levels and Hypertension. *Muhammadiyah Nursing Journal*, 8(3), 30–34. <http://journal.um-surabaya.ac.id/index.php/JKM>
- Lumintang, YF, Natalia, A., & Mariana, D. (2023). Description of Psychological Aspects in Hypertension Patients at Ranomuut Health Center, Manado City. ... *Nursing Science Journal*, 1(1), 64–72. <https://ejournal.unsrat.ac.id/v3/index.php/caring/article/view/46779>
- Massa, K., & Manafe, LA (2022). Compliance in Taking Hypertension Medication in the Elderly. *Sam Ratulangi Journal of Public Health*, 2(2), 046. <https://doi.org/10.35801/srjoph.v2i2.36279>
- Mira Octavia Lingga. (2023). Relationship between stress levels and blood pressure in hypertension patients.
- Nabila, A., Arnita, Y., & Mulyati, D. (2022). Self Management of Hypertension Patients. *JIM FKep*, V, 87–92.
- Najmi Putri Wijanarko. (2024). Description of Physical Activity, Stress and Anthropometrics in Hypertension Patients. 1, 3–7.
- Nuraeni, E. (2019). Relationship of Age and Gender at Risk with Hypertension Incidence at Clinic X, Tangerang City. *JKFT Journal*, 4(1), 1. <https://doi.org/10.31000/jkft.v4i1.1996>
- Pebrisiana, P., Tambunan, LN, & Baringbing, EP (2022). Relationship of Characteristics with Hypertension Incidence in Outpatients at Dr. Doris Sylvanus Regional Hospital, Central Kalimantan Province. *Surya Medika Journal*, 8(3), 176–186. <https://doi.org/10.33084/jsm.v8i3.4511>
- Pratiwi, A. (2020). The Effect of Slow Deep Breathing on Blood Pressure in Hypertension Patients. *Masker Medika*, 8(2), 263–267. <https://doi.org/10.52523/maskermedika.v8i2.414>
- Purba, EJ . (2021). Literature Review: Relationship of Lifestyle with Hypertension Incidence in Elderly. In Thesis: *Health Polytechnic of the Ministry of Health, Medan*.

- Raziansyah, R., & Ridha Amalia, N. (2022). Relationship between Lifestyle and Hypertension Incidence in the Martapura 2 Health Center Work Area. *JoIN: Journal of Intan Nursing*, 1(1), 1-7. <https://doi.org/10.54004/join.v1i1.51>
- Semarang, RH (2021). Hypertension Ranks First as the Most Dangerous Non-Communicable Disease. <https://halosemarang.id/di-semarang-hipertensi-menempati-peringkat-pertama-penyakit-tidak-menular-paling-berbahaya>
- Simanullang, R., & Situmorang, P. (2020). Stress management amidst the impact of covid-19. Medan: Guepedia. https://books.google.co.id/books?hl=id&lr=&id=otlMEAAQBAJ&oi=fnd&pg=PA7&dq=simanullang+%26+Situmorang,+2020&ots=hdiQKaVl1g&sig=pMi6GOIbjiMgS-dOasK9DWr7SU&redir_esc=y#v=onepage&q=simanullang%26Situmorang%2C%202020&f=false
- Situmorang, FD (2020). Relationship between Stress Levels and Hypertension Incidence in Prolanis Members in the Parongpong Health Center Work Area. *Klabat Journal of Nursing*, 2(1), 11. <https://doi.org/10.37771/kjn.v2i1.417>
- Subakti, SH (2019). Thesis: Lifestyle Description of Hypertension Disease in the Inpatient Room of Saint Ignatius, Santa Elisabeth Hospital, Medan in 2019. *Research Journal*, 1-82.
- Sugiyanto, MP, & Husain, Fi. (2022). Relationship between Stress Levels and Hypertension Incidence in the Elderly. *Multidisciplinary Journal of Dehasen (MUDE)*, 1(4), 543-552.
- Sutrisno, S., & Alfiani, O. (2024). Relationship between Stress Levels and Blood Sugar Levels in Diabetes Mellitus Patients in Depok Village, Toroh District. *The Shine Cahaya Dunia S-1 Nursing*, 9(01). <https://doi.org/10.35720/tscs1kep.v9i01.493>
- Tyas, SAC, & Zulfikar, M. (2021). Relationship between Stress Levels and Blood Pressure Levels in the Elderly. *Journal of Contemporary Nursing Research*, 1(2), 75-82. <https://doi.org/10.59894/jpkk.v1i2.272>
- Wijaya, I., Nur Kurniawan. K, R., & Haris, H. (2020). Relationship between Lifestyle and Dietary Patterns to Hypertension Incidence in the Towata Health Center Work Area, Takalar Regency. *Indonesian Health Promotion Publication Media (MPPKI)*, 3(1), 5-11. <https://doi.org/10.56338/mppki.v3i1.1012>