JKM Sai Wawai
Jurnal Kesehatan Metro Sai Wawai
Journal homepage https://ejurnal.poltekkes-tjk.ac.id/index.php/JKM
ISSN Online 2657-1390
ISSN Print 19779-469X

Vol. 17, No. 2, December 2024, 56-64. DOI: http://dx.doi.org/10.26630/jkm.v17i2.4814 Original Article

Lifestyle Risk Factors Increasing the Prevalence of Hypertension in Women of Reproductive Age in Metro City, Indonesia: A Community-Based Case Control Study

Faktor-faktor Risiko Pola Hidup yang Meningkatkan Kejadian Hipertensi Wanita Usia Subur di kota Metro, Indodnesia: Studi Kasus Kontrol Berbasis Komunitas

Meta Shofia[1], Riyanto Riyanto[1]✉, Giri Udani[1], Mapitso Lebuso[2]

[1] Politeknik Kesehatan Kementerian Kesehatan Tanjungkarang, Indonesia

[2] National University of Lesotho, Lesotho

Article Info
Received December 8, 2024
Revised December 16, 2024
Accepted December 26, 2024

Keyword:
Case control study, hypertension, lifestyle, risk factors, women of reproductive age.

Abstract

Introduction: The prevalence of hypertension is still a global health problem, and efforts have been made to control and prevent it, including in Indonesia. However, the trend of high prevalence of hypertension and healthy lifestyle has not indicated a significant decrease, including in women of reproductive age. Objective: This study is to evaluate the lifestyle factors associated with the incidence of hypertension in women of reproductive age, so that evidence base practice can be used in prevention and control efforts. **Methods:** Observational study with case control design involving women of reproductive age with hypertension in Yosomulyo Primary Health Care, Metro city. Case group and control group with a ratio of 26: 26 were selected by consecutive sampling technique that fulfilled the research requirements. Hypertension data was collected using a digital tensimeter, while lifestyle factors data was collected using a questionnaire tool that has been tested for validity and reliability. The chi square test was used to prove the relationship between lifestyle risk factors and hypertension. **Results:** The results showed that lifestyle factors associated with women of reproductive age were obesity (OR=5.127; p=0.012), high sodium consumption (OR=14.00; p=0.000), experiencing stress (OR=8.80; p=0.002), and the use of hormonal contraception (OR=7.50; p=0.021). Meanwhile, exercise activity had no statistical association (p-value 0.404). **Conclusion:** Unhealthy lifestyle factors, such as obesity, excessive sodium consumption, stress and prolonged use of hormonal contraceptives increase the incidence of hypertension in women of reproductive age. Strengthening healthy lifestyle efforts by increasing education on hypertension risk factors to women of reproductive age is important for the prevention and control of hypertension.

Kata kunci:
Hipertensi, studi kasus kontrol, pola hidup, wanita usia subur.

Abstrak

Pendahuluan: Masalah prevalensi hipertensi masih menjadi masalah kesehatan global, termasuk Indonesia telah dilakukan upaya pengendalian dan pencegahan. Namun, trend tingginya prevalensi hipertensi dan pola hidup sehat belum mengindikasikan penurunan yang signifikan, termasuk pada wanita usia subur (WUS). **Tujuan:** Mengevaluasi factor-faktor pola hidup yang berhubungn dengan kejadian hipertensi pada WUS, sehingga dapat digunakan evidence base practise dalam upaya pencegahan dan pengendalian. **Metode:** Studi observasional dengan rancangan case control melibatkan wanita usia subur dengan hipertensi di Pelayanan Kesehatan Primer Yosomulyo, kota Metro. Kelompok kasus dan kelompok control dengan perbandingan 26 : 26 yang dipilih dengan teknik consecutive sampling yang memenuhi syarat penelitian. Data hipertensi menggunakan tensimeter digital, sedangkan data factor-faktor pola hidup dikumpulkan menggunakan alat kuesioner yang telah diuji validitas dan reabilitas. Uji *chi square* digunakan untuk membuktikan hubungan faktor risiko pola hidup dengan hipertensi. **Hasil:** Hasil penelitian menunjukkan bahwa factor pola hidup yang berhubungan dengan wanita usia subur adalah obesitas (OR=5,127; p= 0,012), konsumsi tinggi natrium (OR=14,00; p=0,000), mengalami stress (OR=8,80; p=0,002), dan penggunaan kontrasepsi hormonal (OR=7,50; p=0,021). Sedangkan, aktivitas olahraga tidak ada hubungan secara statistik (p-value 0,404). **Simpulan:** Faktor pola hidup yang tidak sehat, seperti obesitas, konsumsi natrium berlebihan, stress dan lama penggunaan kontrasepsi hormonal meningkatkan kejadian hipertensi pada wanita usia subur. Penguatan upaya pola hidup sehat dengan peningkatan edukasi factor-faktor risiko hipertensi kepada wanita usia subur penting dilakukan untuk pencegahan dan pengendalian hipertensi.

✉ **Corresponding Author:**
Riyanto Riyanto.
Poltekkes Kemenkes Tanjung Karang, Indonesia.
Jalan Soekarno-Hatta No. 06, Bandar Lampung, Provinsi Lampung, 35145, Indonesia
Phone: +6281369445898
Email: riyanto@poltekkes-tjk.ac.id

OPEN ACCESS

How to cite: (APA)
Shofia, M. Riyanto, R., Udani, G. & Lebuso, M. (2024). Lifestyle Risk Factors Increasing the Prevalence of Hypertension in Women of Reproductive Age in Metro City, Indonesia: A Community-Based Case Control Study. *Jurnal Kesehatan Metro Sai Wawai. 15*(1), 56-64. DOI: http://dx.doi.org/10.26630/jkm.v17i2.4814
Published by Politeknik Kesehatan Tanjung Karang, Indonesia. Copyright Holder © Author(s) (2024).
The Published Article is Licensed Under a Creative Commons Attribution-NonCommercial 4.0 International License.

Introduction

High blood pressure (BP, hypertension) is an increase in systolic ≥ 140 mmHg and or diastolic > 90 mmHg is a major public health problem (Forouzanfar et al., 2017; Lim et al., 2020). In addition, as the leading cause of cardiovascular diseases including stroke, the silent killer and one of the most common chronic diseases in the world today (Haththotuwa et al., 2020; Kemenkes, 2020; Lim et al., 2020). Hypertension contributes to 9.4 million deaths and 1.39 billion cases each year (Forouzanfar et al., 2017; Lim et al., 2020). Therefore, WHO calls for effective action against the disease as a silent killer responsible for the global public health crisis (WHO, 2013). It's may be due to the lifestyle among individuals (Aida et al., 2024; Unger et al., 2020), which is the focus of this research and other factors (Nakagomi et al., 2022). Identification of various lifestyle modifiable factors is still important in different regions for hypertension control efforts.

A study reported a substantial upward trend in the prevalence of hypertension between 1990 - 2015 (Forouzanfar et al., 2017), that occurs consistently globally in both low- and high-income countries (Chow et al., 2013). However, several guidelines for hypertension screening and control programmes have been established. In addition, inexpensive and effective antihypertensive treatments are available (Unger et al., 2020). Globally, the prevalence of hypertension differs across regions and income levels. According to WHO, hypertension is highest in Africa (27%) and lowest in the Americas (18%). One of the SDGs for non-communicable diseases is to reduce the prevalence of hypertension by 33% between 2010 and 2030. WHO estimates that worldwide there are 1.28 billion adults aged 30-79 years with hypertension (WHO, 2023). It is reported that the prevalence of hypertension in the age of 30-79 in the world is 33.1% and in the Southeast Asian region is 32.4%. (Kemenkes, 2023), and is expected to increase by a relative 17% by 2030 to 44% from the target of 25% relative decline (WHO, 2023).

In Indonesia, the trend of increasing prevalence of hypertension from 2013-2018 Basic Health Research results respectively 25.8% to 34.1%, and the results of the Indonesian Health Survey in 2023 decreased to 30.8% in 2023 (Kemenkes, 2023). Gender-based analysis in Indonesia showed a tendency for more women (36.85%) to have hypertension than men (31.34%) out of 34.1% of hypertensive patients ≥ 18 years old (Kemenkes RI, 2018). Lusebo, reported the results of his study that one in every five (19.2%) women of reproductive age have hypertension. In addition, hypertensive disease in women contributes to a 28% increase in mortality. Cross-sectional studies show a link between genjer and the incidence of hypertension (Lebuso & De Wet- Billings, 2022). Evidence suggests that many of the factors that contribute to hypertension are modifiable behaviours or lifestyles (Aida et al., 2024; Unger et al., 2020). Several studies have identified lifestyle risk factors associated with increased hypertension, such as an unhealthy diet (excessive salt consumption, a diet high in saturated and trans fats, low fruit and vegetable intake), overweight and obesity, tobacco consumption or smoking (Adeke et al., 2024; Farih et al., 2024; Unger et al., 2020; WHO, 2023). In addition, stress factors and the use of hormonal contraceptives also contribute to the incidence of hypertension, especially in women of reproductive age (Gultom & Batubara, 2022; Rosyid, 2023; Situmorang, 2020; Unger et al., 2020).
However, identification of lifestyle factors associated with gender-based hypertension in women of reproductive age aged 15-49 years is limited. This study aims to evaluate to identify modifiable lifestyle factors that may contribute to the increase of urban-focused hypertension in women of reproductive age. Modifiable lifestyle factors can be a predictor of hypertension which is still limited studied in Metro city, Indonesia. As the prevalence of hypertension has increased in recent years, it is necessary to further evaluate the various lifestyle factors involved. This study is intended to fill the gap in the

literature and contribute to policy planning to prevent the increasing incidence of hypertension and improve control management through efforts to modify healthy lifestyles.

Methods

This study was an observational retrospective case control study design. Women of reproductive age aged 15-49 years who had visited the Community Health Centre with a medical diagnosis of hypertension were recorded as the case group. Meanwhile, the control group was women of reproductive age 15-49 years old who visited the Community Health Centre and Integrated Service Post who did not have hypertension. The research design was used to determine lifestyle risk factors associated with hypertension in women of reproductive age. The study was conducted at Yosomulyo Community Health Centre, Metro city in April-May 2024.

The minimum sample size was calculated using the hypothesis test of two proportions difference with the formula:

$$n = \frac{(Za\ x\ \sqrt{2\ xp\ x\ q}\ + Z\beta\ \sqrt{p1\ x\ q1 + p2x\ q2)^{\ 2}}}{(p1 - p2)}$$

So the sample size was 22.09 or rounded up to 23 by anticipating drop out (plus 10%, so that the minimum sample size was 26 samples for the case group and control group with a ratio of 1: 1. The research inclusion criteria are women aged 15-49 years who are willing to become respondents in the Yosomulyo Puskesmas work area, women aged 15-49 years with hypertension and have children. Meanwhile, the exclusion criteria were women aged > 49 years who were not hypertensive and women aged 15-49 years who were not married. The sampling technique used in this study was consecutive sampling method. Consecutive sampling is sampling that meets the research criteria included in the study until a certain period of time, so that the required number of patients is met.

The types of data used in this study are primary and secondary data. Secondary data is needed to see the case sample, namely hypertension patients at the Yosomulyo Health Centre in Metro city. While primary data is needed to complete the questionnaire that has been prepared where the data is obtained from direct interviews to respondents. This research instrument consists of 3 sets of measurement questionnaires and measurement result sheets to measure variables. The first set of Respondent Characteristics questionnaires contains the characteristics of respondents, including age, education, occupation and screening questions containing questions related to respondents who meet the research requirements (eligible) there are 3 closed questions, namely with the answer "Yes" or "No". The questions were formulated according to the research exclusion criteria developed.

The second set of instruments contained questions to diagnose cases of hypertension or not hypertension by measuring blood pressure and asking for a history of hypertension or not consisting of 3 questions. Blood pressure measurement results >140/90 mmHg are categorised as hypertension and <140/90 mmHg is not hypertension (Unger et al., 2020). The tool used was a manual tensimeter brand ABN spectrum. In addition, it contains a questionnaire for variables of modifiable causal or risk factors of hypertension including a list of questions regarding factors that influence the incidence of hypertension in women of reproductive age who perform routine examinations. The questionnaire used by researchers in this study is a closed questionnaire regarding the relationship between obesity, sodium consumption, sports activity, stress and hormonal contraception, while the measuring instruments used are Stadiometer (height measuring instrument) and needle weight scales (analogue).

Data collection of each research variable was carried out on the case group and control group. The method of selecting the case group was by selecting cases of women of reproductive age

Hypertension recorded in the patient list or patient status according to the doctor's diagnosis at the Yosomulyo Health Centre, Metro City. Meanwhile, the selection of the control group by selecting women of reproductive age who are recorded in the patient list or patient status at Yosomulyo Health Centre, Metro City.

Data analysis used univariate analysis and bivariate analysis. Univariate analysis aims to describe the characteristics of each research variable using proportion / percentage or frequency distribution and percentage of each variable. Bivariate analysis was carried out to see if there was a relationship between stress, physical activity, sodium intake, obesity and the use of hormonal contraceptives on women of reproductive age hypertension using the chi-square test. To be able to determine the degree of significance, the level of significance (α) 0.05 and 95% confidence level were used (Dahlan, 2021). This research protocol has passed the ethical review by the Ethics Committee of the Health Polytechnic of the Ministry of Health Tanjungkarang number 493/KEPK-TJK/VII/2024.

Results

Respondent Characteristics

Table 1 shows that the dominant characteristics of respondents were age > 35 years (88.5%) for the case group and age 20-35 years (69.2%) in the control group, education completed elementary / junior high school 53.8 in the case group and completed high school 42.3%. Meanwhile, the dominant occupation was housewife in each case group (69.2%) and control group 61.5%.

Table 1.
Distribution of Respondents' Characteristics

Characteristics responded	Case Group (n=26)		Control Group (n=26)		Total	
	n =26	%=100	n=26	%=100	n=52	%
Age						
20-35 Years	3	11,5	18	69,2	21	40,4
> 35 Years	23	88,5	8	30,8	31	59,6
Education						
Graduated elementary/junior high school	14	53,8	10	38,5	24	46,2
Graduated from senior high school	7	26,9	11	42,3	18	34,6
College Graduate	5	19,2	5	19,2	10	19,2
Occupation						
Housewife	18	69,2	16	61,5	34	65,4
Self-Employed/Merchant	4	15,4	7	26,9	11	21,2
Civil Servant	4	15,4	3	11,5	7	13,5

Results of Analysis of Lifestyle Risk Factors for the Incidence of Hypertension in Women of Productive Age

Bivariate analysis using chi square test obtained results in table 2, shows there is an association between obesity and the incidence of hypertension in women of reproductive age (p=0.012) and women of reproductive age who are obese have a risk of 5.127 times suffering from hypertension (OR=5.127; CI 95%: 1.568-16.765). There is an association between sodium consumption and the incidence of hypertension in women of reproductive age (p=0.000) and women of reproductive age who consume high sodium have a 14.000 times risk of suffering from hypertension (OR=14.00; CI 95%: 2.728-71.858). There is an association of stress with the incidence of hypertension in women of reproductive age (p=0.002) and women of reproductive age who experience stress have a risk of 8.800

times suffering from hypertension (CI 95%: 2.336-33.152). There is an association of hormonal contraception with the incidence of hypertension in women of reproductive age (p=0.021) and women of reproductive age who use hormonal contraception have a risk of 7.500 times suffering from hypertension (OR=7.500; CI 95%: 1.448-38.846). Meanwhile, the factor of exercise activity had no association with the incidence of hypertension in women of reproductive age (p=0.536, OR=0.536; CI 95%: 0.178-1.616).

Table 2.
Results of analysis of lifestyle factors associated with the incidence of hypertension in women of reproductive age

Lifestyle Variables	Case Group		Control Group		P-value	OR	95% CI
	n=26	%=100	n=26	%=100			
Obesity							
Yes	17	65,4	7	26,9	0,012	5,12	1,568-16,765
No	9	34,6	19	73,1			
Sodium consumption							
High	14	53,8	2	7,7	0,000	14,00	2,728-71,858
Normal	12	46,2	24	92,3			
Exercise activity							
Less	12	46,2	16	61,5	0,404	0,536	2,728-71,858
Enough	14	53,8	10	38,5			
Stress							
Yes	16	61,5	4	15,4	0,002	8,800	2,336-33,152
No	10	38,5	22	84,6			
Using hormonal acceptors							
Yes	24	92,3	16	61,5	0,021	7,50	1,448-38,846
No	2	7,7	10	38,5			

Discussion

This study purpose to identify modifiable lifestyle determinants of hypertension among women of reproductive age in Metro city, Lampung province, Indonesia. The baseline analysis has described the characteristics of respondents that obesity, sodium consumption, stress, and hormonal contraceptive use in the control group were higher at 65.4%, 53.8%, 61.5%, and 92.3%, respectively. Meanwhile, physical activity was more dominant in the control group (53.8%). The picture of an unhealthy lifestyle can increase the predictor of hypertension. The evidence of this study found that lifestyle, such as nutritional status with obesity indicator (OR=5.127; p=0.012), high sodium consumption (OR=14.00; p=0.000), duration of hormonal contraceptive use (OR=7.50; p=0.021), and stress level (OR=8.80; p=0.002) are factors that contribute to the increased prevalence of hypertension in women of reproductive age. Meanwhile, the factor of exercise activity from the results of this study was not significantly associated with the incidence of hypertension in WOMEN OF REPRODUCTIVE AGE (ρ = 0.404).

The results of this study are consistent with previous studies that unhealthy lifestyles trigger an increase in the prevalence of hypertension in women of reproductive age. Study by (Adeke et al., 2024; Farih et al., 2024; WHO, 2023), It has been suggested that unhealthy diets, such as excessive salt consumption, overweight and obesity have an effect on increasing the prevalence of hypertension. (Adeke et al., 2024; Farih et al., 2024; WHO, 2023). In addition, the factors of stress level and duration of hormonal contraceptive use are also triggers that influence the incidence of hypertension (Gultom & Batubara, 2022; Rosyid, 2023; Situmorang, 2020; Unger et al., 2020).

Obesity status increases the odds by 5.127 times in women of reproductive age suffering from hypertensive disease (CI 95%: 1.568-16.765), it is possible that obesity causes several mechanisms in

the body that contribute to increased blood pressure. These mechanisms are dyslipidaemia and atherosclerosis Overweight or obesity will put an extra burden on the heart and blood circulation system which can cause serious health problems, increasing the risk of hypertension (Ayu & Adnan, 2020). The larger a person's body, the more blood is needed to supply nutrients and oxygen to other tissues and muscles. Obesity increases the amount of length of blood vessels which will result in increased resistance of blood that should be able to travel longer distances. The increased resistance results in higher blood pressure. Women of reproductive age who have an obese nutritional status need to increase regular exercise activities such as walking for at least 30 minutes a day and joining gymnastics and other activities to prevent hypertension.

The high sodium consumption factor had a 14,000 times risk of developing hypertension (95% CI = 2,728-71,858). One of the most influential risk factors for hypertension is sodium consumption. Sodium chloride (table salt) and monosodium glutamate (MSG) are sources of sodium that are widely distributed in the community. WHO recommends reducing salt intake to <5 g/day. Similarly, the more adequate or less sodium consumption, the more normal blood pressure can be. This happens because sodium is a micronutrient that is needed in the metabolic process in small or small amounts. Sodium in the body causes the body to retain water at a level exceeding the body's normal limit so that it can increase blood volume and cause blood pressure to increase (Fitri et al., 2022). Women of reproductive age who have a lifestyle of consuming more sodium than the recommended nutritional allowance are at risk of developing hypertension. It is expected that women of reproductive age who experience hypertension can change their food consumption patterns by doing a low salt diet and consuming lots of vegetables and fruits, foods high in animal protein (fish and chicken) and vegetables (nuts) to control blood pressure.

Physical activity can contribute to a person's blood pressure. Lack of physical activity can increase the risk of obesity, which is one of the risk factors for hypertension and other degenerative diseases. Individuals with less physical activity tend to have a higher pulse frequency, so the heart muscle pumps blood harder and more frequently. This will cause greater pressure on the arterial walls. (Pusparani, 2016). Women of reproductive age still have insufficient exercise activity because they rarely exercise regularly, such as walking at least 30 minutes a day, doing routine exercises and other activities, so that they can prevent and control hypertension.

Stress factors increase the risk of hypertension in women of reproductive age by 8,800 times (95% CI: 2,336-33,152). Physiologically, stress can increase pulse rate, blood pressure, respiration and arrhythmia. Prolonged stress can cause activation of the sympathetic nervous system and increased release of norphin from sympathetic nerves in the heart and blood vessels. This results in increased cardiac output and increased systemic vascular resistance. Furthermore, the adrenal medulla secretes more catecholamines (epinephrine and norepinephrine). Activation of the sympathetic nervous system can increase circulating angiostenin II, aldosteon and vasopressin which can increase systemic vascular resistance. Prolonged elevations in angisotensin II and kotekolamines can lead to cardiac and vascular hypertrophy both of which can contribute to a sustained increase in blood pressure (Djafar, 2021). Women of reproductive age need to eliminate or manage stress, so that the individual can deal with stress that may be prolonged and prevent health problems that can be caused, such as hypertension.

Long use of hormonal contraceptives had a 7.500 times risk of hypertension in WOMEN OF REPRODUCTIVE AGE (95% CI; 1.448-38.846). It is possible that hormonal contraceptives contain the hormones oestrogen and progesterone which can cause shrinkage of blood vessels and narrowing of

the heart's blood vessels. In addition, the hormones progesterone and estrogen present in contraceptives can cause an increase in the rate of cardiac hypertrophy and the response of angiotensin II precursors to increase by involving the Renin Angiotensin System pathway, due to the increase in hormones released can cause the hormone aldosterone secreted by the adrenal cortex to cause increased water and sodium retention by the renal tubules, so that intravascular volume can increase which triggers an increase in blood pressure (Wahyuni & Widyasih, 2020). Increased oestrogen metabolism in the body can also increase blood viscosity, resulting in increased blood pressure (hypertension). Women of reproductive age should be routinely screened for hypertension, and if they have been using hormonal contraception for a long time, they should switch to a safe contraceptive method. Because long use of hormonal contraceptives can increase the risk of hypertension (Rosyid, 2023).

Prevention and control of hypertension in women of reproductive age is important, as it can result in maternal mortality during pregnancy and childbirth and the foetus in the womb. Healthy lifestyle education needs to be improved to create awareness and behavioural changes in an effort to reduce the prevalence of hypertension and its serious impact on public health. Decision makers should improve the implementation of hypertension control policies in the community with a healthy lifestyle movement or Healthy Living Community Movement (Germas).

Simpulan

Hypertension in women of reproductive age has increased due to various unhealthy lifestyles. Obesity, high sodium consumption, stress, and the use of hormonal contraceptives increase the incidence of hypertension in women of reproductive age. Efforts to control and prevent hypertension in women of reproductive age need to be pursued by adopting a healthy lifestyle, such as maintaining a diet to prevent obesity, avoiding stress, and regulating the use of hormonal contraceptives as needed. Health education and healthy living campaigns are essential to control the high burden of hypertension in Indonesia. Policy makers should focus on preventive measures and lifestyle changes. In addition to continuing to improve access to health services, especially for women of reproductive age. With healthy lifestyle changes as a major contributing factor, significant progress can be made in controlling hypertension and reducing its impact on public health.

Referensi

Adeke, A. S., Chori, B. S., Neupane, D., Sharman, J. E., & Odili, A. N. (2024). Socio-demographic and lifestyle factors associated with hypertension in Nigeria: results from a country-wide survey. *Journal of Human Hypertension*, *38*(4), 365–370. https://doi.org/10.1038/s41371-022-00673-1

Aida, J., Inoue, Y., Tabuchi, T., & Kondo, N. (2024). Modifiable risk factors of inequalities in hypertension: Analysis of 100 million health checkups recipients. *Hypertension Research*, *47*(6), 1555–1566. https://doi.org/https://doi.org/10.1038/s41440-024-01615-9

Ayu, R. D., & Adnan, N. (2020). The Risk of Hypertension in the Incidence of Coronary Heart Disease in Urban and Rural Communities Indonesia (Longitudinal Analysis of IFLS 2007-2014). *Jurnal Ilmu Kesehatan Masyarakat*, *11*(2), 171–184. https://doi.org/https://doi.org/10.26553/jikm.2020.11.2.171-184

Chow, C. K., Teo, K. K., Rangarajan, S., Islam, S., Gupta, R., Avezum, A., Bahonar, A., Chifamba, J., Dagenais, G., & Diaz, R. (2013). Prevalence, awareness, treatment, and control of hypertension in rural and urban communities in high-, middle-, and low-income countries. *Jama*, *310*(9), 959–968. https://doi.org/doi:10.1001/jama.2013.184182

Dahlan, M. S. (2021). *Statistik untuk Kedokteran dan Kesehatan*. Penerbit Salemba.

Djafar, T. (2021). *Promosi Kesehatan: Penyebab Terjadinya Hipertensi*. https://www.researchgate.net/publication/348337440_PROMOSI_KESEHATAN_PENYEBAB_TERJADINYA_HIPERTENSI

Farih, O. A., Ali, A. O., Abokor, A. H., Ali, M. A., Egge, A. A. A., & Muse, A. H. (2024). Prevalance and determinants of hypertension among adults in Somalia using Somalia demographic health survey data, SDHS 2020. *Current Problems in Cardiology*, *49*(11), 102783. https://doi.org/https://doi.org/10.1016/j.cpcardiol.2024.102783

Fitri, F., Ihsan, H., & Ananda, S. H. (2022). Hubungan Konsumsi Natrium dan Aktivitas Fisik dengan Kejadian Hipertensi pada Masyarakat Pesisir Lingkungan Lemo-Lemo, Kabupaten Bombana. *Jurnal Gizi Ilmiah: Jurnal Ilmiah Ilmu Gizi Klinik, Kesehatan Masyarakat Dan Pangan*, *9*(2), 1–7. https://doi.org/https://doi.org/10.46233/jgi.v9i2.560

Forouzanfar, M. H., Liu, P., Roth, G. A., Ng, M., Biryukov, S., Marczak, L., Alexander, L., Estep, K., Abate, K. H., & Akinyemiju, T. F. (2017). Global burden of hypertension and systolic blood pressure of at least 110 to 115 mm Hg, 1990-2015. *Jama*, *317*(2), 165–182. https://doi.org/doi:10.1001/jama.2016.19043

Gultom, A. B., & Batubara, A. (2022). Stress dan Tekanan Darah pada Pasien Wanita dengan Hipertensi. *Jurnal Penelitian Kesehatan" SUARA FORIKES"(Journal of Health Research" Forikes Voice")*, *13*(3), 848–851.

Haththotuwa, R. N., Wijeyaratne, C. N., & Senarath, U. (2020). Worldwide epidemic of obesity. In *Obesity and obstetrics* (pp. 3–8). Elsevier. https://doi.org/10.1016/B978-0-12-817921-5.00001-1

Kemenkes, R. (2020). *Profil Kesehatan Indonesia Tahun 2019*. https://www.kemkes.go.id/downloads/resources/download/pusdatin/profil-Kesehatan-Indonesia/Profil-Kesehatan-Indonesia-2019.Pdf

Kemenkes, R. (2023). *Visualisasi Data SKI 2023: Prevalensi, Dampak, serta Upaya Pengendalian Hipertensi & Diabetes di Indonesia*. https://p2ptm.kemkes.go.id/uploads/cEdQdm1WVXZuRXhad3FtVXduOW1WUT09/2024/09/factsheet PTM 24aprl07.30.pdf

Kemenkes RI. (2018). Laporan Riskesdas 2018. *Laporan Nasional Riskesdas 2018*, *53*(9), 154–165.

Lebuso, M., & De Wet- Billings, N. (2022). The prevalence and socio-demographic correlates of hypertension among women (15–49 years) in Lesotho: a descriptive analysis. *BMC Public Health*, *22*(1), 562. https://doi.org/10.1186/s12889-022-12960-0

Lim, H. J., Xue, H., & Wang, Y. (2020). Global trends in obesity. *Handbook of Eating and Drinking: Interdisciplinary Perspectives*, 1217–1235. https://link.springer.com/referenceworkentry/10.1007/978-3-030-14504-0_157

Nakagomi, A., Yasufuku, Y., Ueno, T., & Kondo, K. (2022). Social determinants of hypertension in high-income countries: A narrative literature review and future directions. *Hypertension Research*, *45*(10), 1575–1581. https://doi.org/10.1038/s41440-022-00972-7

Pusparani, I. D. (2016). *Gambaran gaya hidup pada penderita hipertensi di puskesmas ciangsana kecamatan gunung putri kabupaten bogor*. UIN Syarif Hidayatullah Jakarta: Fakultas Kedokteran dan Ilmu Kesehatan, 2016. https://repository.uinjkt.ac.id/dspace/handle/123456789/37348

Rosyid, A. (2023). Hubungan Penggunaan Kontrasepsi Hormonal dengan Hipertensi Pada Wanita Usia Subur. *Nutrix Journal*, *7*(1), 84–89.

Situmorang, F. D. (2020). Hubungan tingkat stres dengan kejadian hipertensi pada anggota prolanis di wilayah kerja Puskesmas Parongpong. *Klabat Journal of Nursing*, *2*(1), 11–18.

Unger, T., Borghi, C., Charchar, F., Khan, N. A., Poulter, N. R., Prabhakaran, D., Ramirez, A., Schlaich, M., Stergiou, G. S., & Tomaszewski, M. (2020). 2020 International Society of Hypertension global hypertension practice guidelines. *Hypertension*, *75*(6), 1334–1357. https://www.ahajournals.org/doi/full/10.1161/HYPERTENSIONAHA.120.15026

Wahyuni, L. N., & Widyasih, H. (2020). *Hubungan Penggunaan Kontrasepsi Hormonal Dengan Kejadian Hipertensi Pada Akseptor KB Di Wilayah Kelurahan Sendang Sari Tahun 2019*. Poltekkes Kemenkes Yogyakarta.

WHO. (2013). *Global overview of hypertension. A "silent killer" responsible for a global public health crisis. 2013.* https://iris.who.int/bitstream/handle/10665/85334/WHO_DCO_WHD_2013.2_fre.pdf?sequence=1

WHO. (2023). *Hypertension*. https://www.who.int/news-room/fact-sheets/detail/hypertension