



Risk Factors For Hypertension In Indonesia: Scoping Review

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Abstract. Hypertension is a non-communicable disease contributing significantly to global mortality, especially among individuals with middle to lower economic conditions. Financial constraints often lead to more attention to routine health checks. This study aims to summarize research on risk factors contributing to hypertension using a scoping review method. Articles were sourced from Google Scholar, ProQuest, ScienceDirect, Neliti, and Semantic Scholar, resulting in 552 articles screened, with seven meeting the inclusion and exclusion criteria. The findings reveal that age, gender, family history, smoking habits, and stress are key factors associated with hypertension. The study concludes that everyone is at risk of developing hypertension, but preventive measures, such as avoiding these risk factors, can significantly reduce the likelihood. Public awareness and access to affordable health services are essential to address hypertension effectively and mitigate its impact.

Keywords: Hypertension, Risk Factor, Indonesia

1 Introduction

A country will be prosperous if its mortality and morbidity rates are balanced. By looking at a country's morbidity or mortality rate, we can already conclude its health results. The sum of mortality and morbidity is called the disease burden [1]. According to WHO, non-communicable diseases are a disease burden that kills 41 million people or is equivalent to 74% of all deaths globally. Then, deaths due to NCDs in low and middle-income countries have data of around 77%, which means that almost all deaths worldwide are caused by NCDs. [2]. the Riskesdas also shows that the number of people ≥ 18 years old is not tiny. This assessment is divided into two: doctor's diagnosis and measurement results by health workers. When viewed based on the diagnosis made by doctors, hypertension cases throughout Indonesia have a rate of 8%. Meanwhile, when viewed based on the results of measurements by health workers, Indonesia has a rate of 30.8%. [3] However, when viewed from the Databoks, the prevalence of hypertension in Riskesdas in 2018 reached 34.1% and is now decreasing to 30.8% in 2023 [4]. According to WHO, hypertension is defined as a disease caused when the blood pressure in the blood vessels is higher than usual or around 140/90 mmHg or even higher than that. Hypertension is also a common cause of death

for 1.28 billion adults, 46% of whom are unaware that they have hypertension. Then only 21% of those people are aware and willing to control the disease. Usually, some of the possibilities that can cause hypertension in a person are due to age, genetics, obesity, too high consumption of salt, and also the habit of consuming high levels of alcohol. Based on this background, the incidence of hypertension is unbalanced and can increase suddenly, considering that many risk factors can cause a person to develop hypertension. Therefore, researchers want to analyze the factors that influence hypertension in Indonesia. This research is intended to add insight to the readers and help them be vigilant in preventing the emergence of hypertension.

2 Method

2.1 Research design

This research design uses scoping review research, which contains descriptions and findings obtained by reading and evaluating research materials from several library sources, such as books, theses, and other libraries.

2.2 Framework Usage

This research utilizes a search strategy of the POST framework to find journals. Population/Problem (people with hypertension), Outcome (Hypertension), Study Design (Scoping Review), and Time (2022-2023).

2.3 Search Keywords

The keywords used in English and Indonesian are Faktor Risiko AND Hipertensi, Determinants AND Hypertensions, Risk Factor AND Hypertension, Risk Factor AND High Blood Pressure.

2.4 Database Source

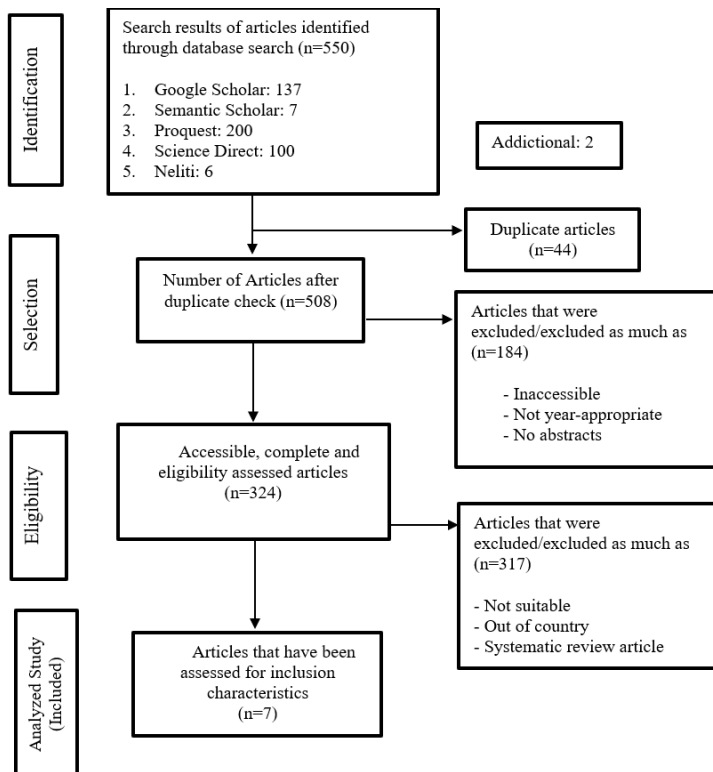
This research uses data from research journals conducted by previous researchers, which were obtained using the Google Scholar, Semantic Scholar, Pro Quest, Science Direct, and Neliti databases.

2.5 Journal Search Results

After searching for articles in each database, 550 journals were found. Then, selection was carried out on all journals so that 7 journals fit the inclusion character, as seen in the PRISMA diagram in Figure 1.

Table 1. Inclusion/Exclusion Criteria

Criteria	Inclusion	Exclusion
Population	The community diagnosed with hypertension	The community that is undiagnosed with hypertension
Study Design	Cross-sectional, case-control, case study	Systematic review, literature review
Year of Publication	2016–2023	2010–2015
Language	Indonesian and English	Japanese, Russian, Chinese, Arabic, and others
Country	Indonesia	Malaysia, Thailand, Myanmar, America, and others

**Fig. 1.** Prisma Flow Diagram

3 Results

After performing several actions in the selection process of each journal, such as reading and identifying each journal, the author found seven articles that were considered eligible based on the inclusion characteristics determined by the author. All remaining articles have been identified, starting from the abstract, the variables used, and the conclusions of each article. The articles found have different research designs and samples but still lead to one study about what factors may cause hypertension. Therefore, the researcher selected articles that show what variables cause hypertension. As listed in Table 1.

Summary of Studies on Hypertension Risk Factors

Table 2: Characteristics of the study

Author	Research Title	Design/ Methods	Results	Sample
[5]Azhari. MH	Factors Associated with the Incidence of Hypertension at Makrayu Health Center, Ilir Barat II District Palembang	Study Design Cross-sectional	The results showed that the variables associated with hypertension were family history, age, gender, occupation, and exercise.	112 respondents with hypertension
[6]Doanaresta D, et al.	Risk Factors for Hypertension in Female Farmers Aged 45-65 Years in Karangawen II Health Center, Demak Regency	Study Design Case-Control	The results of this study indicate that the variables associated with hypertension are sodium intake, family history, and stress. While those not associated with BMI include the percentage of body fat, smoking, and physical activity.	Female farmers aged 45-65 years

[7]Iriyanti M, et al.	Analysis of Determinants of Hypertension in Coffee Farmers in the Working Area of Puskesmas Simpang Tiga Bukit District, Bener Meriah Regency 2017	Study Design Case-Control	The results of this study showed that the variables associated with hypertension were age, family history, coffee drinking, smoking, and income. While unrelated variables are gender, fat consumption, and physical activity.	Ten farmers, 55 cases, and 55 controls
[8]Oktaviarini E, et al.	Risk Factors for Hypertension among Employees in the Port Perimeter Area (Study at the Semarang Class II Port Health Office)	Study Design Case-Control	The results of this study indicate that the variables associated with hypertension are male gender and type of work. Age, family history, workload, work period, work schedule, coffee drinking, and smoking habits are unrelated variables.	76 employees diagnosed with hypertension, 38 cases, and 38 controls
[9]Puspitasari AL	Risk Factors for Hypertension in 20-44-Year-Olds at Kawatuna Community Health Center, Palu City	Study Design Case-Control	The results of this study showed that the variables associated with hypertension were less consumption of fruits and vegetables and BMI. Meanwhile, the unrelated variable is the smoking habit.	188 total samples, cases by total sampling and controls by purposive sampling

[10]Tri Solehaini D	Risk Factors for Hypertension in Sungai Asam Village, Koni Health Center Working Area, Jambi City	Study Design Cross-sectional	The results of this study indicate that the variables associated with hypertension are family history, stress, salt consumption, and consumption of fatty foods. Variables unrelated are less fruit and vegetable consumption and tobacco use.	Population aged 15 years and above, totaling 200 people
[11]Wulandari Fitri W	Factors Associated with the Incidence of Hypertension	Study Design Cross-sectional	The results of this study indicate that the variables associated with hypertension are age, gender, BMI, physical activity, and family history. As for variables that are not associated with hypertension, smoking was not significant.	85 people visiting the health center

4 Discussion

This study uses the Indonesian region as an inclusion requirement to conduct this research. This is because the hypertension rate shown in the year-end health results from RISKESDAS indicates that there is always a significant increase but not a decrease in cases. Hypertension is still one of the cases of disease that is considered trivial by many people who consider hypertension a typical incident. Based on the analyzed journals, several risk factors can cause a person to develop hypertension. Of the 552 total journals that I identified, seven journals discussed risk factors that cause hypertension, including age, gender, family history, occupation, smoking habits, coffee drinking habits, and stress. These variables have been analyzed and found to influence hypertension.

4.1 Age And Gender

Increasing one's age can affect systolic and diastolic blood pressure. This is because age will show how the pattern of life will be lived, both diet and lifestyle [12]. A study in the United States used the ages of men and women from the Tsimane and Western tribes to examine their relationship with hypertension. The study found that women have lower blood pressure at a young age than men. But that changes when you pass the age of 50 and above, when women's blood pressure is the same as men's blood pressure. The study also said that the decrease in diastolic blood pressure resulted from a decrease in cardiac output and increased the stiffness of large arteries. [13]. Then other studies also say that age can cause hypertension. This is evidenced by the research results that the risk of increasing systolic blood pressure will develop faster in the first phase at the age of 35-55 years than in the second phase at the age of 55-80 years. This study also supports the research above by saying that there is a difference between these phases because women experience menopause. Then, after that, blood pressure in women will be higher than in men. The study says that some changes will appear in the first phase of age, such as hardening of the aorta and reduced elasticity in blood vessels. In addition, arterial wall damage due to stiff arteries also appears when a person has entered the first phase of old age. [14] One of the studies conducted using the same topic also showed that there was a significant association between age and gender with the incidence of hypertension. In old age, the arteries in the blood vessels begin to stiffen, and the symptoms of systolic hypertension appear. In addition, old age can cause hypertension due to hormonal changes in the vascular system. Women who have experienced menopause can help increase HDL levels, which prevent the incidence of atherosclerosis, which is the cause of high blood pressure and hypertension. (Nurhayati et al., 2023). After analyzing 7 (seven) articles, three articles agree that age and gender together have a significant relationship with hypertension [7], [11], [5]. All three articles researched farmers, hypertensive patients, and community members visiting health centers. Then, it was analyzed using different design methods, namely case-control and crosssectional design methods. From these three journals, we can see that age and gender have a significant association with hypertension, but this does not rule out the possibility that several other articles discussing the same topic found no significant association between age and gender with hypertension.

4.2 Family History

Family history is when important gene information from parents is passed on to their children. In this case, the information refers to biological relationships or inherited medical conditions. Family history can predict a child's good and bad condition. A South Korean study says that parental hypertension may be the dominant cause of hypertension in adolescents [16]. This is in line with the results of research conducted on five articles that have been identified. These five articles agree and say that there is a significant association between the incidence

of hypertension and family history. The five studies used a population of female farmers, coffee farmers, people aged 15 years and above, and people visiting the health center [12], [5], [7], [10], [6]. The results of this study are supported by research conducted by Taslima et al. (2017), who conducted research on older people at the Kuta Alam Banda Aceh Health Center. This study states that there is a relationship between family history and the incidence of hypertension [17]. The same research was also conducted by Annisa et al. (2017), who researched all XI-grade students at SMA Sejahtera 1 Depok. This study also said that a family history of hypertension was also a dominant factor in the incidence of hypertension. This research also resulted in diverse results due to differences in background, race, and different environments at the time of the study [18]. Then other supporting results were also found in a study at Puskesmas Kuta Utara by I Made et al (2016), which also stated that hypertension can be caused by family history as a risk factor.

4.3 Smoking Habits

Hypertension is a non-communicable disease that can usually appear or increase due to risk factors in the form of bad habits such as drinking alcohol, eating unhealthy food, and also smoking. Smoking is not a habit that is only owned by older people, usually many teenagers also start trying to follow this habit. In this case, smoking can be said to be one of the risk factors that cause hypertension, like a study on active smokers at the Pancaran Kasih Masyarakat Hospital in Manado. This study says that there is a relationship between smoking and the incidence of hypertension. The study also noted that the respondents had a reasonably strong smoking habit and lacked the vigilance to conduct routine health checks [19]. After the analysis of 7 articles that had been identified, 2 articles were found that stated there was an association between smoking habits and the incidence of hypertension. However, 5 other articles said there was no association between smoking and hypertension [9], [7]. This is revealed by a study conducted in South Kashmir using cohort research methods. This study found no association between smoking and the incidence of hypertension. However, this can happen because of inconsistent data due to the time it takes to research this. However, researchers believe that smoking is a risk factor that can cause 90% of hypertension [20]. A study that supports the relationship between smoking habits and hypertension is conducted by Suprpto et al (2021) on people who make health visits in the working area of the Barombong Health Center, Makassar City, in 2019. This study states that there is a strong positive relationship between smoking and hypertension [21]. Other research that supports this is found in a study conducted by A viridis, et al (2010) which found the results that smoking can cause effects on the incidence of hypertension. Researchers also added that smokers who develop hypertension have the possibility of developing malignant and renovascular hypertension, an effect caused by accelerated atherosclerosis [22].

4.4 Stress

UNICEF Indonesia argues that stress is a feeling that we can generally feel when we are under pressure, feel overwhelmed, or have difficulty dealing with a situation. Excessive stress can be difficult to control, affecting our mood, physical and mental health, and our communication with others [23]. The Ministry of Health also says that stress can trigger headaches, high blood pressure, stroke, asthma, depression, and many other health problems. A study by Sandip, et al (2018) was conducted on patients aged 30 years and above. This study says that high stress has a significant relationship with hypertension. In addition, researchers also found that stress is an independent risk factor for hypertension. In this study, 2 (two) researchers found an association between stress and the incidence of hypertension. This study was conducted on people aged 15 years and over and also female farmers using case-control and cross-sectional research methods. Meanwhile, 5 (five) other studies said that there was no relationship between stress and the incidence of hypertension in the respondents they studied. The relationship between stress and the incidence of hypertension is supported by several studies conducted by Tanya (2013), who said that exposure to stress experienced by a person contributes to the development of hypertension. This is because when stress occurs, the sympathetic nervous system response will appear, causing an increase in heart rate, cardiac output, and blood pressure. So when the body fails to regain its composure and stress continues to recur, there will be a combination of events that cause hypertension [24]. Other research that supports the study is a study conducted in Sigi Regency. This study also found an association between stress and hypertension. This study also found an association between stress and hypertension. This long-lasting stress can cause a person to end up with hypertension [25]. In addition, there are also studies conducted on adults using the meta-analysis study method. This study used a database to find articles that discuss the relationship between stress and hypertension in Asia, Europe, Africa, and America. The results of this study indicate that high stress is a risk factor for the incidence of hypertension in adults when compared to adults who do not have stress [26].

5 Conclusion

Everyone has the same chance of being able to get hypertension. However, hypertension can be prevented by staying away from what factors can cause hypertension.

References

1. Roser, M., Ritchie, H., Spooner, F.: Burden of Disease. (2024). Accessed: August 26, 2024. <https://ourworldindata.org/burden-of-disease>
2. WHO: Noncommunicable diseases. (2023). Accessed: August 26, 2024. <https://www.who.int/news-room/fact-sheets/detail/noncommunicable-diseases>

3. BPS: Dalam Angka: Kota Kediri Dalam Angka. (2018). pp. 1–68.
4. Santika, E.F.: Prevalensi Hipertensi Indonesia Turun Jadi 30.8% pada 2023. (2024). Accessed: August 26, 2024. <https://databoks.katadata.co.id/datapublish/2024/07/05/prevalensi-hipertensi-indonesia-turun-jadi-308-pada-2023>
5. Azhari, M.H.: Faktor-Faktor yang Berhubungan dengan Kejadian Hipertensi di Puskesmas Makrayu Kecamatan Ilir Barat II Palembang. *Jurnal Aisyah: Jurnal Ilmu Kesehatan* **2**(1), 23–30 (2017).
6. Doanaresta, D., Probosari, E., Purwanti, R.: Faktor Risiko Kejadian Hipertensi Pada Petani Wanita Usia 45–65 Tahun di Puskesmas Karangawen II Kabupaten Demak. *Buletin Penelitian Kesehatan* **48**, 19–30 (2020). Accessed: August 14, 2024. <https://garuda.kemdikbud.go.id/documents/detail/1689197>
7. Iriyanti, M., Siregar, F.A., Aulia, D.: Analisis Determinan Kejadian Hipertensi Pada Petani Kopi di Wilayah Kerja Puskesmas Simpang Tiga Kecamatan Bukit Kabupaten Bener Meriah Tahun 2017. *Farmasi Indonesia Surakarta* **4**(2016), 1–6 (2020).
8. Oktaviarini, E., Hadisaputro, S., Suwondo, A., Setyawan, H.: Faktor yang Berisiko Terhadap Hipertensi pada Pegawai di Wilayah Perimeter Pelabuhan (Studi Kasus Kontrol di Kantor Kesehatan Pelabuhan Kelas II Semarang). *Jurnal Epidemiologi Kesehatan Komunitas* **4**(1), 35 (2019).
9. Puspitasari, A.L.: Faktor Risiko Kejadian Hipertensi Pada Usia 20–44 Tahun di Puskesmas Kawatuna Kota Palu. *Ghidza: Jurnal Gizi dan Kesehatan* **2**(2), 67–70 (2018).
10. Tri Solehaini, D., Novita Eka Rini, W., Asparian, Kunci, K.: Faktor Risiko Hipertensi di Kelurahan Sungai Asam Wilayah Kerja Puskesmas Koni Kota Jambi. *Jurnal Kesmas Jambi* **2**(2), 353621 (2018). Accessed: August 14, 2024. <https://www.neliti.com/publications/353621/>
11. Wulandari, F.W., Ekawati, D., Harokan, A., Murni, N.S.: Faktor-Faktor yang Berhubungan dengan Kejadian Hipertensi. *An Idea Nursing Journal* **1**(01), 43–50 (2022).
12. Soesanto, E., Marzeli, R.: Persepsi Lansia Hipertensi dan Perilaku Kesehatannya. *Jurnal Keperawatan dan Kesehatan Masyarakat Cendekia Utama* **9**(3), 244 (2020).
13. Gurven, M., Blackwell, A.D., Rodríguez, D.E., Stieglitz, J., Kaplan, H.: Does blood pressure inevitably rise with age?: Longitudinal evidence among forager-horticulturalists. *Hypertension* **60**(1), 25–33 (2012).
14. Cheng, W., Du, Y., Zhang, Q., Robinson, E.L.: Age-related changes in the risk of high blood pressure. (2022). pp. 1–10 (September).
15. Nurhayati, U.A., Ariyanto, A., Syafriakhwan, F.: Hubungan usia dan jenis kelamin terhadap kejadian hipertensi. *Jurnal Kesehatan* **1**(2018), 363–369 (2025).
16. Eun, J., Hye, Y., Park, S.: Relationship between parental hypertension and cardiometabolic risk factors in adolescents. (2017). pp. 678–683 (December).
17. Husna, A.: Hubungan Riwayat Keluarga dan Gaya Hidup dengan Hipertensi pada Lansia di Puskesmas Kuta Alam Banda Aceh. *Jurnal Kesehatan* **3**(1), 121–131 (2017).
18. Angesti, A.N., Triyanti, Sartika, R.A.D.: Riwayat Hipertensi Keluarga Sebagai Faktor Dominan Hipertensi pada Remaja Kelas XI SMA Sejahtera 1 Depok Tahun 2017. *Buletin Penelitian Kesehatan* **46**, 1–10 (2017).
19. Rondonuwu, R., Tuegeh, J., Sarimin, D.S., Nazila, M.: The Relationship between Smoking Behavior and the Occurrence of Hypertension in Pancaran Kasih General Hospital Manado. (2015). pp. 159–163.

20. Wagai, G.A., Jeelani, U., Beg, M.A., Romshoo, G.J.: Relationship between hypertension and smoking: A preliminary study in South Kashmiri population of J & K. (2023).
21. Mulat, T.C., Syamsi, N., Lalla, N., Info, A.: Jurnal Kesehatan Masyarakat. Jurnal Kesehatan Masyarakat **17**(1), 37–43 (2021).
22. Virdis, A., Giannarelli, C., Neves, M.F., Taddei, S., Ghiadoni, L.: Cigarette smoking and hypertension. *Current Pharmaceutical Design* **16**(23), 2518–2525 (2010).
23. UNICEF Indonesia: Apa itu stres? — UNICEF Indonesia. (2022). Accessed: September 5, 2024. <https://www.unicef.org/indonesia/id/kesehatan-mental/artikel/stres>
24. Spruill, T.: Chronic Psychological Stress and Hypertension. *Current Hypertension Reports* **12**(1), 10–16 (2013).
25. Metungku, F., Mauruh, C.V., Sari, A.N.I., Salamung, N., Uswatun, U.: Relationship between Lifestyle and Stress with Hypertension among Communities in Sigi Regency. *D’Nursing Health Journal* **2**(1), 52–59 (2021).
26. Ni’mah, S.L.K., Sukma, S.: Relationship of High Stress with Hypertension in Adults: Meta Analysis. *Jurnal Epidemiologi dan Kesehatan Masyarakat* **7**(1), 130–141 (2022).

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