JFN JOURNAL OF FUNDAMENTAL NURSING
Volume 01 Number 01 (November 2025)
p-ISSN: 0000-0000
e-ISSN: 0000-0000

Review

Risk factors of hypertension in the elderly in Indonesia

Hamidah Retno Wardani[1]

[1]Faculty of Medicine, Universitas Jember, Indonesia

Abstract:
Elderly age is the stage when there is a decline in organ function. The elderly period is related to a decrease in physical ability to live and individual sensitivity. The elderly are a vulnerable group at risk because the elderly are people whose health problems decrease due to the increasing age experienced by the elderly resulting in all systems and functions experiencing a decrease, one of which is experiencing non-communicable diseases, namely hypertension. So, the family becomes the main support system for the elderly in maintaining their health. The study was conducted using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). The keywords used were Hypertension, Risk factors, Elderly, Indonesia using the crossref database and google scholar so that 15 articles were obtained that fit the inclusion criteria. Data was generated from 15 journals that had been screened. A total of 226 journals were obtained using the google scholar and crossref journal search methods. Google scholar as many as 206 and crossref as many as 20 research journals. The results showed that risk factors that have an association with the incidence of hypertension in the elderly include gender, BMI, genetic, age, occupation, obesity, income, family history of hypertension, physical activity, cholesterol level, diet, smoking, previous history of hypertension, and salt consumption. Hypertension is a disease that can be influenced by risk factors that can be changed and cannot be changed. Risk factors play an important role in the occurrence of hypertension in the elderly.

Keywords:
risk factors, hypertension, elderly, indonesia

Article Info:
Submitted:
01-11-2025
Revised:
11-11-2025
Accepted:
13-11-2025

Corresponding Author:
Hamidah Retno Wardani
19930111202506200 5@mail.unej.ac.id

DOI: https://doi.org/10.53713/jfn.vxix.xxx

INTRODUCTION

Indonesia is one of the largest countries in Southeast Asia. Indonesia is rich in agricultural products and has a diverse population, so health development in Indonesia is a crucial effort to enable everyone to live a healthy life and achieve optimal health status. The government's success in the health sector has improved the quality of population health and life expectancy (UHH). This can be seen from the increasing number of elderly people in Indonesia (Butarbutar et al, 2021).

The elderly are individuals aged 60 years and over, a classification that refers to someone who has reached the final phase of life. The elderly, in general, have undergone a life process known as the Aging Process. The elderly are prone to various diseases that attack in old age, such as hypertension. According to data from the World Health Organization in 2014, there were

Volume 01 Number 01 (November 2025)
p-ISSN: 0000-0000
e-ISSN: 0000-0000

approximately 600 million people suffering from hypertension worldwide. The highest prevalence of hypertension occurs in African countries, which is 30%. The lowest prevalence of hypertension is in the Americas at 18%. In general, females have a higher risk of developing hypertension than males' gender (Mustapa, Susanto, Asmaningrum, 2023). An estimated 1.28 billion adults aged 30-79 years worldwide suffer from hypertension, most of whom (two-thirds) live in low- and middle-income countries. An estimated 46% of adults with hypertension are unaware that they have the disease. Less than half of adults (42%) with hypertension are diagnosed and treated (Mustapa, Susanto, Asmaningrum, 2023).

Blood pressure increases with age and is a common condition in the elderly. The Framingham Heart Study reported that the prevalence of hypertension increased from 27.3% among patients under 60 years old to 74.0% among those over 80 years old. The Global Brief on Hypertension report, World Health Organization, shows that nearly one billion people worldwide suffer from high blood pressure (hypertension), and two-thirds of them occur in developing countries (WHO, 2023). The incidence of hypertension is very high, especially in the elderly population, aged over 60 years, with prevalence reaching 60% to 80% of the elderly population. Data shows that the prevalence of hypertension in Indonesia continues to increase in the elderly age group, namely at the age of 65-74 years by 63.2% and age over 75 years by 69.5% (Mitra & Wulandari, 2019).

As we age, blood pressure tends to increase, and hypertension is often considered a normal condition in the elderly. Maintaining the blood pressure of the elderly at 140/90 mmHg is a very difficult endeavor. This is related to various factors such as age, weight (obesity), lower education level, unbalanced diet, drinking habits, and comorbidities (Margiyanti & Sari, 2023). The aging process experienced by the elderly and increased blood pressure in the elderly are the main factors for hypertension in the elderly. Increased blood pressure in the elderly is a normal condition; however, maintaining blood pressure at a normal level remains a challenging task for most people (Susanto et al., 2019).

Several studies also show that the risk factors for hypertension include research showing that there is a relationship between the occurrence of hypertension and risk factors such as educational status, employment status, comorbid diseases, the use of anti-hypertensive drugs, and the number of drugs consumed (Yunanto et al, 2020). Another study showed that several risk factors such as history of hypertension, family history of hypertension affect the occurrence of hypertension in the elderly (Sukmaningtyas & Utami, 2020).

The aging process experienced by the elderly makes it difficult for them to carry out their daily activities independently, especially during this pandemic, so they tend to depend on others. Other people who care for these elderly people can be referred to as caregivers. The elderly truly need family support due to these limitations. Family is crucial in maintaining the health of the elderly (Dwi, Utami, & Zairina, 2022). The family is the main support system for the elderly in maintaining their health. The role of the family in caring for the elderly is to maintain and improve their mental status, anticipate socio-economic changes, and provide motivation and facilitate the spiritual needs of the elderly (Prabasari, Juwita, Maryuti, 2017). Families are also referred to as informal caregivers. This informal caregiver is often a family member of the elderly themselves, such as children, grandchildren, sons-in-law, and others. This informal caregiver is also referred to as a family caregiver. Being an informal caregiver for the elderly is not easy; there are various problems that arise, objective care problems, namely practical problems due to care, such as cost problems when

Volume 01 Number 01 (November 2025)
p-ISSN: 0000-0000
e-ISSN: 0000-0000

providing care, reduced input, lifestyle restrictions, problems with family relationships, and negative impacts on family caregivers (Tutpai, Unja, Nura, 2021).

Based on the description above, the researcher is interested in analyzing research articles on risk factors for hypertension in the elderly in Indonesia. To date, numerous national and international publications have examined the risk factors for hypertension in the elderly. Therefore, this study aims to analyze the risk factors for hypertension in the elderly, drawing on several national and international journals.

METHOD

Research design

The study was conducted using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA), which was carried out systematically by following the correct stages of research protocols. The procedure of this systematic review consists of several steps, namely 1) compiling background and objectives; 2) Research question; 3) Searching for the literature; 4) Selection criteria; 5) Practical screen; 6) Quality checklist and procedures; 6) Data Extraction strategy.

Inclusion Criteria

The sample inclusion criteria in this research article include the following: 1) Fulltext article; 2) English; 3) Published in 2010-2023; 4) The type of research design in the article is cross sectional/prospective study; 5) The topic of hypertension research in the elderly in Indonesia; 6) Research using primary data; 7) research conducted since 2010. The number of sources obtained from databases, including Google Scholar (206) and Crossref (20).

Article Sources

The two main electronic databases used for identification of relevant sources were Google Scholar and Crossref, published from 2010 to 2023.

Search Strategy

The researcher also scanned the reference list to match citations related to the research objectives. The database search was conducted from February 1-5, 2024. The keywords used were: 'Hypertension', 'Risk factors', 'Elderly', and 'Indonesia'.The keywords above were then combined using Boolean operators into the following search: (“Hypertension”) AND (“Risk Factors”) AND (“Elderly”) AND (“Indonesia”). The selection of articles was adjusted to the inclusion and exclusion criteria determined through the PICOS Framework.

Volume 01 Number 01 (November 2025)
p-ISSN: 0000-0000
e-ISSN: 0000-0000

Article Selection

Articles were selected based on the inclusion and exclusion criteria. The flow of article screening is presented in Figure 1 below.

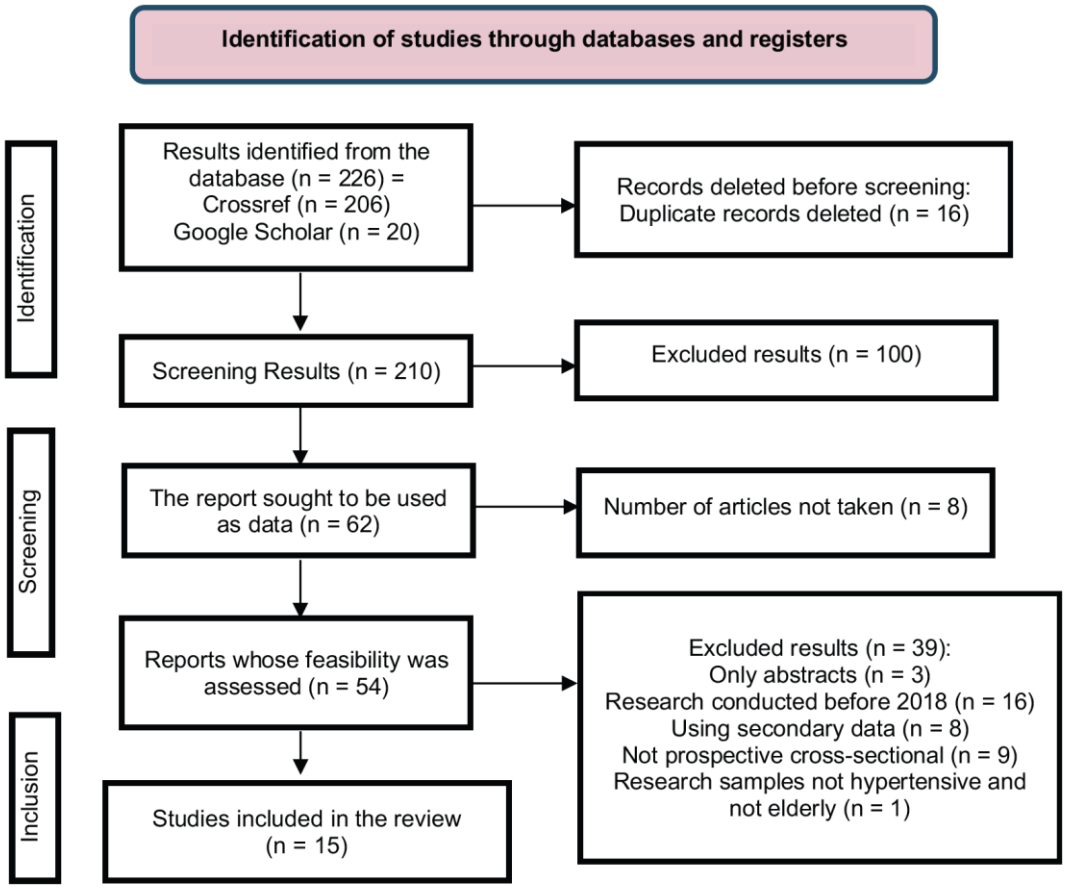

Figure 1. Flow of Journal Identification

(https://www.prisma-statement.org/prisma-2020-flow-diagram)

Data Extraction

Each journal was extracted separately. Parameters were extracted from each research journal, including title, author, venue, total sample size, Variables studied, Research Design, Year of publication, and Results.

RESULT

This study identified 226 journals. Journal identification was carried out by screening based on eligibility criteria, resulting in 9 articles being selected for further review. The population in this study

Volume 01 Number 01 (November 2025)
p-ISSN: 0000-0000
e-ISSN: 0000-0000

was articles published in international and national journals on the topic of hypertension in the elderly in Indonesia. The sample in this study was articles published in international and national journals on the topic of risk factors for hypertension in the elderly in Indonesia. Analysis of the identified articles showed that all journals used the cross-sectional/prospective study method. This data extraction is performed by analyzing data based on the author's name, title, research method, year of publication, and results, specifically grouping important data from the article. The results of data extraction are in Table 1.

Table 1. Article Data Extraction Results

No	Title	Author	Setting	Sample	Variable	Methodology	Year of publication	Results
1	Factors Associated with the Incidence of Hypertension in the Elderly at the Millenium Clinic in Medan	Butarbutar et al	Medan	17	Gender, BMI, Genetic	Cross sectional	2021	Gender (0.004), BMI (0.031), Genetik (0.010)
2	Triggering factors related to hypertension in the City of Kendal, Indonesia	PH & Basthomi	Kendal	428	Age, Gender, Heredity, Employment, Level of Obesity	Cross-Sectional	2020	Usia (0.000), gender (0.000), hereditas (0.000), pekerjaan (0.000), obesitas dan hipertensi (0.000)
3	The relationship between income and nutritional status with the incidence of hypertension in elderly	Sariyanti, Hanim & Anantanyu	Klaten	133	Income, Nutritional status (Obesity, Overweight, Normal, Low)	Cross-sectional	2021	Pendapatan (0.046), status nutrisi (0.641)
4	Risk Factors Analysis of Hypertension Disease in The Elderly at Girirejo Stasi in Samarinda	Sastrini & Pertiwi	Samarinda	30	Physical activity, Age, Family history of hypertension, Cholesterol level, Body mass index	Cross-sectional	2022	Family history of hypertension (0.042), physical activity (0.021), body mass index (0.258), cholesterol level (0.015)
5	Factors Which Influence Incident Hypertension on Pre-Elderly	Siregar & Siregar	Bintujuh Village	55	Habit eats, Activity Physique, Habit smoke	Cross-sectional	2022	Habit eats (0.003), activity physique (0.044), habit smoke (0.002)
6	Risk Factors of Hypertension in the Elderly	Sukmaningtyas & Utami	Banyumas Regency	217	Hypertension history, family hypertension history, habit of smoking	Retrospective approach	2019	Hypertension history (0.001), family hypertension history (0.001), habit of smoking (0.700)
7	The Relationship of Risk Factors to the Incidence of Hypertension in Pre-Elderly and Elderly (study in Ternate City)	The, Hasan, Imbar & Dika	Ternate Regency	299	Age, family history, salt intake, obesity, dyslipidemia, gender, smoking habits, alcohol consumption	Cross-sectional	2023	Age (0.005), sex (0.599), family history (0.000), smoking (0.058), alcohol consumption (o.818), salt consumption (0.001), obesity (0.002), dyslipidemia (0.052)

No	Title	Author	Setting	Sample	Variable	Methodology	Year of publication	Results
8	Prevalence of hypertension and related factors among older people in nursing home of Jember, East Java, Indonesia	Yunanto, Susanto, Rasni, Susmaningrum, Nur	Jember	42	Age, Gender, Ethnic, Education, Working history, Marital status, KATZ, SPMSQ, MMSE, Depression, Spiritual	Cross-sectional	2019	Age (0.036), gender (0.133), ethnic (0.647), education (0.155), working history (0.903), marital status (0.449), KATZ (0.953), SPMSQ (0.204), MMSE (0.167), Depression (0.391), Spiritual (1.000)
9	The Relationship between Lifestyle and Hypertension Cases at UPT Cibiru Public Health Center Bandung City	Sutriyawan, Apriyani, Miranda	Bandung	74	Physical Activity, Diet, Smoking behaviour	Cross-sectional	2021	Physical activity (0.022), diet (0.326), smoking behaviour (0.003)
10	Factors Affecting Hypertension in the Elderly	Wahyuningsih, Endri Astuti	Yogyakarta	73	age, gender, genetic, smoking habits, exercise habits, coffee drinking habits, and salt consumption.	Cross-sectional	2013	Gender (0.979), age (0.017), family history (0.858), smoking habit (0.989), exercise habit (0.049), coffee habit (0.843), salt consumption (0.456), personality type (0.007), obesity (0.049), stress (0.256), stress (0.007), obesity (0.049), and salt consumption (0.256). (0.256)
11	Risk factors of isolated systolic hypertension in the elderly	Abdul Farid Lewa, I Dewa Putu Pramantara, Th. Baning Rahayujati	Yogyakarta	238	smoking habit psychosocial stress and less physical activity	Cross sectional	2010	risk factors for the prevalence of ISH in the elderly at Kalibawang whereby smoking habit OR =3.353 (95% CI 1.375-8.172); psychosocial stress OR = 2.449 (95% CI 1,408-4,260) and less physical activity, OR =1.970 (95% CI 1.110-3.495).
12	Analysis of Risk Factors for Hypertension in the Elderly in the Health Center Working Area Rapak Mahang Subdistrict, Tenggarong District, Kutai Regency Kartanegara	Wiwin Vidiyastana Afifah, K Irfansyah Baharuddin Pakki, Tanti Asrianti	Kutai Kertanegara	128	variables of family history of hypertension, obesity and smoking physical activity	Cross sectional	2022	variable family history of hypertension (p value = 0.003), obesity (p value = 0.000) and physical activity (p value = 0.019) with the incidence of hypertension. pertention. Variable smoking (p value=0.361)
13	Differences Risk Factors for Hypertension Among Elderly Woman in Rural	Erni Astutika, Farapti Faraptib , Tika D. Tamac , and Septa Puspikawati	Surabaya	54	The risk factors for hypertension in the urban area were urine sodium level,	Cross sectional	2021	The risk factors for hypertension in the urban area were urine sodium level (AOR=1.02, 95% CI=1.001-1.04, p-

No	Title	Author	Setting	Sample	Variable	Methodology	Year of publication	Results
	and Urban Indonesia				urine potassium level, and Body Mass Index, Meanwhile, the factor associated with hypertension in the rural area was age.			value=0.043), urine potassium level (AOR=0.88, 95% CI=0.78-0.999, p-value=0.022), and Body Mass Index (AOR=1.26, 95% CI=1.06-1.49, p-value=0.008). Meanwhile, the factor associated with hypertension in the rural area was age (AOR=1.08, 95% CI=1.003-1.16, p-value=0.042).
14	The risk factors of hypertension in Indonesia (data study of indonesian family life survey 5)	Dewi Nur Khasanah	Surabaya	4790	gender, age, employment status, physical activity, and obesity.	Cross sectional	2022	Gender (p=0,000), age (p=0.000), employment status (p=0.003), physical activity (p=0.011), and obesity (p=0.000). Through logistic regression, the factors that affect hypertension include gender (p=0,000), age(p=0.000), physical activity(p=0.015), and obesity(p=0.000)
15	The Prevalence and Social Determinants of Hypertension among Adults in Indonesia: A Cross-Sectional Population-Based National Survey	Karl Peltzer, Supa Pengpid	Indonesia	29965	Blood pressure, body height and weight, dietary behaviour, physical activity, tobacco use, and psychosocial variables	Cross sectional	2018	prevalence of hypertension among study participants was 33.4 % (95 % CI: 32.7-34.0), among males 31.0% (95% CI: 30.2, 31.9), and among females 35.4% (95% CI: 34.6, 36.3). Among hypertensives, 42.9% were aware, 11.5% were treated, and 14.3% were controlled. Significant linear relationships of hypertension were found with age (P for trend <0.001) and body mass index (BMI) (P for trend < 0.001). In addition, among men having quit tobacco use and depressive symptoms were positively associated with hypertension, while current tobacco use was negatively associated with hypertension. Moreover, among women lower subjective economic status was associated with hypertension.

Volume 01 Number 01 (November 2025)
p-ISSN: 0000-0000
e-ISSN: 0000-0000

The journals identified through the screening results were 9 journals, encompassing a total of 1,295 elderly samples. The research was conducted in several regions in Indonesia from 2010 to 2022. From the results of the study, it was found that there are several risk factors associated with the incidence of hypertension in the elderly, such as gender, BMI, genetics, age, occupation, obesity, income, family history of hypertension, physical activity, cholesterol level, diet, smoking, history of hypertension, and salt consumption.

Research conducted by Butarbutar et al shows that gender (0.004) has a relationship with the occurrence of hypertension in the elderly. In line with research by PH & Basthomi (2020) also shows that gender (0.000) has a relationship with the occurrence of hypertension in the elderly in Indonesia. Apart from gender, risk factors such as body mass index (0.031) also have a relationship with the occurrence of hypertension in the elderly (Butarbutar et al, 2021; Setyoko & Nurcahyati, 2020). This is different from the research conducted, which shows that body mass index has no relationship with the occurrence of hypertension in the elderly. Other risk factors that show an association with the incidence of hypertension in the elderly include genetic, age, occupation, obesity, family history of hypertension, physical activity, and cholesterol level (Butarbutar et al, 2021; Yunanto et al, 2019; Setyoko & Nurcahyati, 2020; Ph & Bastomi, 2020). In the risk factors of nutritional status, ethnicity, education, employment history, marital status, KATZ, SPMSQ, MMSE, depression, spirituality, alcohol consumption, salt consumption, and diet. There are studies that show no relationship between the occurrence of hypertension in the elderly (The et al., 2023; Susanto et al., 2019; Ph & Bastomi, 2020).

DISCUSSION

An increase in life expectancy (UHH) will lead to an increase in the number of elderly people. The growth of this elderly population requires special attention, where the elderly will experience the aging process and experience several changes that will cause health problems, one of which is hypertension. This condition is one of the targets of the 2015-2030 Sustainable Development Goals (SDGs) program, focusing on health aspects related to the prevention and treatment of non-communicable diseases, such as hypertension in the elderly (Siregar, 2022). Hypertension is second only to rheumatic heart disease among the most common cardiovascular crises in rural and urban India. Hypertension is a common condition that affects millions of people worldwide. Its treatment and prevention rely heavily on knowledge of the condition and associated risk factors (Putri, Ekawati, Wati, 2019). Hypertension is defined as blood pressure (BP) of 140 mmHg or higher and/or diastolic pressure of 90 mmHg or higher (WHO-ISH guidelines). When systolic blood pressure is equal to or greater than 140 mmHg (with a diastolic blood pressure of 90 mmHg or less), isolated systolic hypertension (ISH) is said to be present, which is common in geriatric patients. Hypertension is characterized by elevated systolic blood pressure with normal or decreased diastolic blood pressure, often due to the hardening of the large arteries (arteriosclerosis) in older adults. Hypertension in the elderly has been shown to have a multifactorial etiology. Impaired autoregulation of target organ blood flow reduced vascular elasticity, impaired baroreceptor reflexes, cardiac remodeling, hypertrophy, and reduced left ventricular diastolic function, renal dysfunction (Hari et al., 2020). Below are some of the risk factors that often occur in the elderly in Indonesia.

Volume 01 Number 01 (November 2025)
p-ISSN: 0000-0000
e-ISSN: 0000-0000

Gender

Butarbutar et al's research (2021) and PH & Basthomi's research (2020) show that gender has an influence on the incidence of hypertension in the elderly in Indonesia. Gender is closely related to the occurrence of hypertension, where in women it is higher when a woman experiences menopause. Women who have not experienced menopause are protected by the hormone estrogen, which plays a role in increasing High-Density Lipoprotein (HDL) levels. High HDL cholesterol levels are a protective factor in preventing atherosclerosis. The protective effect of estrogen is considered a key explanation for female immunity during the premenopausal age. This is in accordance with research by Yuliarti (2007), which states that there is a significant relationship between gender and the incidence of hypertension. This shows that the incidence of hypertension in women is influenced by estrogen levels. The estrogen hormone levels decrease when women enter old age (menopause), making them more susceptible to hypertension (Setyoko & Nurcahyati, 2020; Putri, Rekawati, & Wati, 2019).

In another study conducted by Nita Widjaya (2019), it was found that 115 people, mostly female respondents (58, 50.4%), had the highest age range of 18-40 years old, with 71 (61.7%) respondents (9). This research is supported by research conducted by Mariza Elvira (2019) that women who have experienced menopause will tend to experience hypertension caused by low levels of estrogen in the blood, which can cause an increase in LDL levels in the blood, so as triggering an atherosclerotic process, which in turn can trigger hypertension. This is because women who have experienced menopause have low levels of estrogen. Whereas this estrogen functions to increase HDL levels, which are very instrumental in maintaining healthy blood vessels. In menopausal women, decreased estrogen levels are also accompanied by a decrease in HDL levels, unless a good lifestyle is maintained (Widjaja et al., 2020).

Body Mass Index

Research by Butarbutar et al. (2021) indicates that BMI has an impact on the incidence of hypertension in the elderly (Butarbutar et al., 2021). It can be concluded that respondents with excess / over / obese BMI tend to have excess blood pressure/hypertension. This is in accordance with the theory that hypertension and obesity are closely related disorders; hypertension associated with obesity generally has the characteristics of plasma volume expansion and increased cardiac output, hyperinsulinemia and insulin resistance, increased sympathetic nervous system activity, sodium retention, and dysregulation of salt-regulating hormones. The prevalence of hypertension accompanied by obesity is increasing. This is not only the case in developed countries, but also a problem in developing countries. This is closely related to globalization and lifestyle changes, which have led to an increase in the prevalence of overweight or obesity. Negative lifestyle changes have a negative impact on the body's response. This leads to metabolic changes and the incidence of adipocytopathy.

Genetics

However, research by Butarbutar et al. (2021) and PH & Basthomi (2020) indicates that genetics plays a role in elderly hypertension (Setyoko & Nurcahyati, 2020). Several publications

Volume 01 Number 01 (November 2025)
p-ISSN: 0000-0000
e-ISSN: 0000-0000

have shown that genes play a major role in the development of hypertension. Hereditary traits account for more than 50%. Other studies that support this data are compatible (monozygotic) and incompatible (dizygotic) twins, who have also shown that genetic components are closely related to hypertension. Previous studies have shown that epigenomic changes can be biomarkers of specific interactions between genetic risk factors.4 The largest epigenomic research study on diastolic blood pressure, which included 17,000 participants of European descent, African descent, and Hispanic ethnicity from the Cohorts for Heart and Aging Research in Genomic Epidemiology (CHARGE), identified 13 CpG sites that were significantly associated with systolic or diastolic blood pressure.5 This study evaluated the association between the 13 CpGs, both individually and combined into MRSSBP and MRSDBP methylation risk scores. MRSSBP score was positively associated with systolic blood pressure of 1.7 mmHg per 1 standard deviation in MRSSBP in European ancestry (=1.6; p=0.001), and MRSDBP with diastolic blood pressure in the full sample (=1.1; p=0.04), Asian ancestry (=1.4; p=0.03), and African ancestry (=1.4; p=0.03). The MRS risk score and genetic factors were independently associated with blood pressure in individuals of European ancestry (Defiana et al., 2021).

Age

Research by PH & Basthomi (2020), The et al. (2023), and Yunanto et al. (2019) shows that age has an influence on the incidence of elderly hypertension (Setyoko & Nurcahyati, 2020; Ph & Bastomi, 2019; Susanto et al, 2019). This finding aligns with research conducted by Khasanah (2021), which suggests that age is a significant factor in the development of hypertension, particularly among the elderly. Other studies have also shown that age is a factor in increasing blood pressure in the elderly (19). Hypertension increases with age. The results of Anggara's research in 2013 found that the highest number of hypertensive patients were found in the age group > 65 years. Hypertension is a multifactorial disease resulting from the interaction of various risk factors that a person experiences. Increasing age causes physiological changes in the body, such as thickening of the uterine wall due to the accumulation of collagen substances in the muscle layer, resulting in narrowing and stiffening of blood vessels starting at around 45 years of age. In addition, there is also an increase in peripheral resistance and sympathetic activity and a lack of baroreceptor sensitivity (regulating blood pressure and the role of gonads, blood flow, and glomerular filtration rate). According to research from Febby Hendra in 2012, there is a relationship between age and the incidence of hypertension. This is because arterial pressure increases with age, aortic regurgitation, and degenerative processes, which are more common in old age.

Work

The study by PH & Basthomi (2020) indicates that work does not have a significant impact on the incidence of hypertension in the elderly. The results of this study indicate that there is no significant relationship between self-employed workers and the incidence of hypertension among informal sector workers in the Working Area of the Jagakarsa Subdistrict Health Center in 2022. Similar research results are also found in the study by Lestari et al (2019), which indicated that there is no relationship between the type of occupation and the incidence of hypertension. The results of this study do not align with those of Ningsih (2017), which found a significant relationship between

Volume 01 Number 01 (November 2025)
p-ISSN: 0000-0000
e-ISSN: 0000-0000

the type of occupation and the incidence of hypertension. Work patterns are influenced by the type of job, where those who engage in physically active work may be protected from the risk of hypertension compared to those who perform jobs that do not require physical activity. Drivers, security officers, and tailors are some examples of jobs with low physical activity levels, making them highly susceptible to hypertension.

Obesity

Research by PH & Basthomi (2020) and The et al. (2023) indicates that obesity has a significant impact on the incidence of hypertension in the elderly. The influence of obesity on hypertension is also in line with the research conducted by Aditya and Ana (2016), which found that individuals with obesity have a risk of developing hypertension that is 1.147 times greater compared to those without obesity. Obesity or an increased BMI is also associated with higher blood pressure in both men and women, as reported in a study conducted by Sihombing (2009). Another study that aligns with this is Agnesia's research (2012), which states that obesity is one of the risk factors for hypertension, with a risk of occurrence 9.051 times greater compared to individuals who are not obese.

Income

The research by Sariyanti, Hanim & Anantanyu (2021) shows that income has an influence on the incidence of hypertension in the elderly. This finding aligns with the research by Kharisyanti & Farapti (2017), which demonstrates a significant relationship between income levels and the incidence of hypertension (Khazanah, 2022; Sariyanti, Hanim, & Anantanyu, 2020). The results of this study are in line with the research by Michelle et al., which found that at the level of low-income groups, there is a higher risk of hypertension compared to high-income groups. The meta-analysis study conducted by Sarki et al. also showed that low- and middle-income countries have significant results for the occurrence of hypertension. Income level refers to the income sourced from the formal sector, informal sector, and sub-system sector within a one-month period, measured in rupiah. Income levels can be linked to a person's purchasing power. High income can provide purchasing power with guaranteed quality, especially in daily consumption. Conversely, with low income, purchasing power, particularly in family consumption, such as low fruit and vegetable consumption, is also less complete and varied. So, this can be a factor in the high prevalence of hypertension. Systematic review data in developing countries proves that the unhealthy consumption patterns in low SSE communities can be explained by the higher prices of "healthier diets".

Family History of Hypertension

Research by Sastrini & Pertiwi (2022), Sukmaningtyas & Utami (2019), and The et al. (2023) indicates that a family history of hypertension has a significant impact on the incidence of hypertension in the elderly. This is in line with the research, which shows that there is a family history of hypertension, with 58% of those with a family history experiencing hypertension compared to 38.2% of respondents without a family history. The results of the Chi-Square Test show a significant relationship between family history and the occurrence of hypertension (p-value = 0.033). Family

Volume 01 Number 01 (November 2025)
p-ISSN: 0000-0000
e-ISSN: 0000-0000

history is a factor that can increase the risk of hypertension in the elderly. Elderly individuals with a family history of hypertension have an 8.8 times greater risk of developing hypertension. This is supported by research indicating that each family has similar genetics, lifestyle, and dietary patterns, which significantly correlates with the incidence of hypertension in the elderly (Utomo dan Herbawani, 2022).

Physical Activity

Research by Sastrini & Pertiwi (2022), Siregar (2022), and Sutriyawan, Apriyani, & Miranda (2021) indicates that physical activity has a significant influence on the incidence of hypertension in the elderly. This finding is also in line with the research conducted by Khasanah (2021), which suggests that physical activity influences the incidence of hypertension in the elderly. Physical activity is the movement performed by the body's muscles and their supporting systems. During activities, muscles require energy beyond metabolism to move, while the heart and lungs need additional energy to supply nutrients and oxygen to the entire body and to expel waste from the body.

Cholesterol Level

The study by Sastrini & Pertiwi (2022) demonstrates that cholesterol levels have a significant impact on the incidence of hypertension in the elderly (Sariyanti, Hanim, Anantanyu, 2020). However, the study by The et al. (2023) indicates that cholesterol levels do not significantly impact the incidence of hypertension in the elderly. This finding aligns with the research by Cahyaningsih (2021), which suggests that cholesterol levels are associated with the development of hypertension. This finding aligns with the research by Sri Hidayati et al. in 2019, which identified a relationship between cholesterol levels and the incidence of hypertension, with a p-value of 0.04 ($p < 0.05$). The study conducted by Heni Maryati in 2017 on the relationship between cholesterol levels and blood pressure in hypertensive patients in Jombang had a result of $p = 0.000$ ($p < 0.05$) and a Correlation Coefficient value of 0.668, thus concluding that there is a significant and strong relationship between cholesterol levels and blood pressure in hypertensive patients. Based on previous research, high cholesterol levels increase the risk of atherosclerosis, which can lead to various non-communicable diseases such as coronary heart disease, stroke, and others. Atherosclerosis begins with the accumulation of cholesterol, particularly LDL cholesterol, in the arterial walls. Normally, LDL can enter and exit the endothelial wall, and LDL will undergo complete oxidation, which can transform macrophages into foam cells. The foam cells that are formed will create clots that gradually enlarge, resulting in lumps that can cause narrowing of the blood vessel lumen and increase the heart's workload in pumping blood, thereby triggering an increase in blood pressure.

Diet

Research by Siregar & Siregar (2022) shows that diet has an influence on the incidence of hypertension in the elderly (Sutriyawan, Apriyani, Miranda, 2021). However, research by Sutriyawan, Apriyani & Miranda (2021) shows that diet does not have an influence on the incidence of hypertension in the elderly. In both hypertensive and non-hypertensive patients, dietary regulation, prevention, and improvement can be achieved, one of which is by reducing sodium intake to 1,500

Volume 01 Number 01 (November 2025)
p-ISSN: 0000-0000
e-ISSN: 0000-0000

mg/day (approximately 2/3 teaspoon per day) (Sutriyawan, Apriyani, Miranda, 2021). Salt is one of the essential components in food that humans need. However, consuming excessive salt poses a risk of hypertension. Because everyone has a different sensitivity to the amount of sodium consumed in their body. An elderly person experiences a decrease in the sensitivity of taste and smell, resulting in a reduced appetite. Sodium is one of the dissolved components in the blood that has the property of binding water, causing water to be absorbed into the intravascular space, which increases blood volume. The increase in blood volume results in an increased workload for the heart, leading to a rise in blood pressure (Syarli & Arini, 2021).

Smoking

Research by Siregar & Siregar (2022) and Sutriyawan, Apriyani, & Miranda (2021) shows that smoking has an influence on the incidence of hypertension in the elderly. Smoking is one of the risk factors for developing hypertension. Nicotine in cigarettes is the cause of increased blood pressure immediately after the first puff. Like other chemical substances in cigarette smoke, nicotine is absorbed by the very small blood vessels in the lungs and distributed into the bloodstream. In just a few seconds, nicotine reaches the brain. The brain reacts to nicotine by signaling the adrenal glands to release epinephrine. (adrenalin). This powerful hormone constricts blood vessels and forces the heart to work harder due to the higher pressure, as well as the role of carbon monoxide, which can replace oxygen in the blood and help the heart meet the body's oxygen needs. Smoking a cigarette will have a significant impact on increasing blood pressure. This is because cigarette smoke contains approximately 4000 chemicals, 200 of which are toxic, and 43 others can cause cancer in the body (Smoking can increase vascular stiffness) (The et al., 2023; Sutriyawan, Apriyani, Miranda, 2021).

Salt Consumption

The research by The et al. (2023) shows that salt consumption has an impact on the incidence of hypertension in the elderly (Ph & Bastomi, 2024). An increase in blood pressure will occur at the age of over 30 years if sodium intake in the body rises from 37 to 50 mmol per day. The average systolic blood pressure will increase by 5 mmHg. Meanwhile, the diastolic blood pressure will increase by 3 mmHg. Perki (2015) added that a healthy lifestyle practiced by an individual can lower blood pressure and is very beneficial in reducing the risk of cardiovascular problems. One of the healthy lifestyle patterns referred to is reducing salt intake, with a recommendation to consume less than 2000 mg/day, which can lower systolic blood pressure by 3.47 mmHg, as advised by the WHO. (Ariani, 2020). Based on the research analysis conducted by Adam (2019), it is stated that consuming excessive salt and not adhering to a low-salt diet for hypertension sufferers can lead to the worsening of their hypertension. The worse someone's salt consumption behavior, the more severe their hypertension can become. Researchers assume that this is caused by high sodium intake in salt due to excessive consumption, leading to the narrowing of arteries. This narrowing makes the heart work harder to pump blood through the narrowed arterial spaces, thereby increasing blood pressure. In line with the theory that excessive salt consumption increases sodium concentration in extracellular fluid, to normalize it, intracellular fluid is drawn out, thereby increasing the volume of extracellular fluid. The increased volume of extracellular fluid leads to an increase in blood volume, which in turn results in the onset of hypertension. Therefore, it is recommended that

Volume 01 Number 01 (November 2025)
p-ISSN: 0000-0000
e-ISSN: 0000-0000

sodium consumption be reduced. The main sources of sodium are sodium chloride (table salt), the cooking flavor enhancer monosodium glutamate (MSG), and sodium carbonate. The recommended daily consumption of table salt (which contains iodine) is no more than 6 grams, equivalent to one teaspoon.

Alcohol Consumption

The et al (2023) study shows that alcohol consumption has no effect on the incidence of hypertension in the elderly. A different finding was obtained in the research. Based on the research results, it was found that elderly individuals who consume more alcohol (50%) belong to the hypertensive group compared to the non-hypertensive group (26.3%). Elderly individuals who consume alcohol are 2.8 times more likely to suffer from hypertension compared to those who do not consume alcohol ($p<0.05$). The research results indicate that among elderly individuals who have consumed alcohol for 41-50 years and 31-40 years, a significant influence on the occurrence of hypertension was found. Each has 3.78 times and 4.12 times higher risk of developing hypertension compared to those who do not consume alcohol (Ph & Bastomi, 2024).

Ethnicity

The research by Yunanto et al. (2023) shows that ethnicity does not influence the incidence of hypertension in the elderly. However, this differs from the study conducted by Utomo and Herbawani (2022), which indicates that there is a correlation between ethnicity and the incidence of hypertension in the elderly because certain ethnic groups have dietary habits that can increase the risk of hypertension (Susanto et al, 2019; Pertiwi & Yastrini, 2022).

Education

The research by Yunanto et al (2023) shows that education does not have an impact on the incidence of hypertension in the elderly. This finding aligns with the research conducted by Rahma (2022), which revealed no relationship between education level and the incidence of hypertension among the elderly group in East Kalimantan in 2018. This result is consistent with the research by Podungge (2020), which also found no relationship between education level and the incidence of hypertension. The absence of this relationship is due to the almost identical percentages at each level of education. The results of this study indicate that the elderly group in East Kalimantan who suffer from hypertension mostly have a low level of education (37.8%). The level of education is an indicator of a person's ability to comprehend the information they obtain and can influence their mindset and perspective. The higher a person's level of education, the greater the opportunity to apply the knowledge they possess (Fuadah, 2018). Knowledge plays a crucial role in shaping a person's attitude towards something. Then, a person's attitude will influence behaviors such as health behaviors (Susanto et al, 2019).

Volume 01 Number 01 (November 2025)
p-ISSN: 0000-0000
e-ISSN: 0000-0000

KATZ, SPMSE, MMSE, and Depression

The study shows that KATZ, SPMSE, MMSE, and Depression do not have an influence on the incidence of hypertension in the elderly. This is in line with the research, which found no relationship between stress and hypertension. This could be due to the fact that when the data collection was conducted, the elderly individuals were not experiencing stress or specific issues that could lead to prolonged stress (Susanto et al, 2019).

CONCLUSION

Hypertension is a non-communicable disease that often occurs in the elderly. This can be caused by various risk factors. Hypertension is one of the chronic diseases that often affects the elderly. The condition of the elderly is one of the stages that requires support primarily from the family in maintaining both physical and psychological health. In this case, the family can help and improve not only health issues but also the quality of life and motivation of the elderly in managing hypertension. Some risk factors for hypertension in elderly family members include gender, BMI, genetics, age, occupation, obesity, income, family history of hypertension, physical activity, cholesterol levels, diet, smoking, history of hypertension, and salt consumption. However, many elderly people are still unaware of the risk factors that can cause hypertension in the elderly. Therefore, comprehensive information is needed through a literature review that summarizes many studies on the risk factors for hypertension in the elderly.

ACKNOWLEDGEMENT

We would like to express our gratitude to those who have contributed to this research, especially the Universitas Jember.

CONFLICT OF INTEREST

There is no conflict of interest in this study.

REFERENCES

Adam, L. (2019). Determinan hipertensi pada lanjut usia. *Journal of Health Science and Justice (JHSJ), 1*(2), 82–89. https://doi.org/10.37311/jhsj.v1i2.2558

Anam, K. (2023). Examines the correlation between knowledge, demographic characteristics, and hypertension incidence among outpatients in a community health center located in Banjarmasin, Indonesia. *Pakistan Journal of Life and Social Sciences, 21*(1). https://doi.org/10.57239/PJLSS-2023-21.1.004

Butarbutar, M. H., Chaniago, A. D., Ferusgel, A., & Isabella, N. (2021). Factors associated with the incidence of hypertension in the elderly at the Millenium Clinic in Medan. *The Science Midwifery, 9*(1).

Cornwell, E. Y., & Waite, L. J. (2012). Social network resources and management of hypertension. *Journal of Health and Social Behavior, 53*(2), 215–231. https://doi.org/10.1177/0022146512446832

Defianna, S. R., Santosa, A., Probandari, A., & Dewi, F. S. T. (2021). Gender differences in prevalence and risk factors for hypertension among adult populations: A cross-sectional study in Indonesia. *International Journal of Environmental Research and Public Health, 18*(12), 6259. https://doi.org/10.3390/ijerph18126259

Dwi, N. S., Utami, W., & Zairina, E. (2022). The influence of feeling lonely and received social support on medication adherence in elderly with hypertension. *Jurnal Farmasi dan Ilmu Kefarmasian Indonesia, 9*(3).

Indrayani, I., & Ronoatmodjo, S. (2018). Faktor-faktor yang berhubungan dengan kualitas hidup lansia di Desa Cipasung Kabupaten Kuningan tahun 2017. *Jurnal Kesehatan Reproduksi, 9*(1), 69–78. https://doi.org/10.22435/kespro.v9i1.892.69-78

Kharisyanti, F., & Farapti, F. (2017). Status sosial ekonomi dan kejadian hipertensi. *Media Kesehatan Masyarakat Indonesia (MKMI), 13*(3), 200. https://doi.org/10.30597/mkmi.v13i3.2643

Khasanah, D. N. (2022). The risk factors of hypertension in Indonesia (Data study of Indonesian Family Life Survey 5). *JPHRECODE, 5*(2), 80. https://doi.org/10.20473/jphrecode.v5i2.27923

Kusumawaty, J., Hidayat, N., & Ginanjar, E. (2016). Hubungan jenis kelamin dengan intensitas hipertensi pada lansia di wilayah kerja Puskesmas Lakbok Kabupaten Ciamis. *Mutiara Medika: Jurnal Kedokteran dan Kesehatan (MMJKK), 16*(2).

Lewa, A. F., Pramantara, D. P., & Rahayujati, B. (2010). Risk factors of isolated systolic hypertension in the elderly. *Berita Kedokteran Masyarakat, 26*(4).

Margiyati, M., & Sari, N. W. (2023). Pemberdayaan caregiver keluarga berbasis online dalam perawatan lansia dengan hipertensi di era pandemi COVID-19. *Jurnal Abdi Kesehatan dan Kedokteran, 2*(1).

Mitra, M., & Wulandari, W. (2019). Factors affecting uncontrolled blood pressure among elderly hypertensive patients in Pekanbaru City, Indonesia. *Open Access Macedonian Journal of Medical Sciences, 7*(7).

Mustapa, G. W., Susanto, T., & Asmaningrum, N. (2023). The role of informal caregivers in improving the physical, mental health, and quality of life of elderly with hypertension: Literature review. 5(1).

Peltzer, K., & Pengpid, S. (2018). The prevalence and social determinants of hypertension among adults in Indonesia: A cross-sectional population-based national survey. *International Journal of Hypertension, 2018*, 5610725. https://doi.org/10.1155/2018/5610725

Pertiwi, G. H., & Sastrini, Y. (2022). Risk factor analysis of hypertension disease in the elderly at Girirejo Stasi in Samarinda. *Journal of Health and Science Nursing (JHSN), 8*(11), 39–46. https://doi.org/10.53555/hsn.v8i11.5426

Ph, L., & Basthomi, Y. (2020). Triggering factors related to hypertension in the city of Kendal, Indonesia. *Arterial Hypertension, 24*(4), 181–191. https://doi.org/10.5603/AH.a2020.0024

Prabasari, N. A., Juwita, L., & Maryuti, I. A. (2017). Pengalaman keluarga dalam merawat lansia di rumah (studi fenomenologi). *Jurnal Ners Lentera, 5*(1).

Putri, N. R. I. A. T., Rekawati, E., & Wati, D. N. K. (2019). Relationship of age, gender, hypertension history, and vulnerability perception with physical exercise compliance in elderly. *Enfermería Clínica, 29*, 541–545. https://doi.org/10.1016/j.enfcli.2019.04.083

Volume 01 Number 01 (November 2025)
p-ISSN: 0000-0000
e-ISSN: 0000-0000

Rahmah, A. A. (n.d.). Faktor-faktor yang berhubungan dengan kejadian hipertensi pada kelompok lanjut usia (≥65 tahun) di Kalimantan Timur (Analisis lanjut data Riskesdas 2018). [Unpublished report].

Rahmawati, R., & Wijayanti, D. (2021). Scoping review: Hubungan jenis kelamin dan usia dengan penyakit hipertensi. 7(1).

Setiani, R., & Wulandari, S. A. (2023). Hubungan faktor genetik dengan kejadian hipertensi: Scoping review. *Jurnal Integrasi Kesehatan dan Sains (JIKS), 5*(1), 60–66. https://doi.org/10.29313/jiks.v5i1.11126

Setyoko, L. O., & Nurchayati. (n.d.). Gratitude pada caregiver keluarga yang merawat lansia. *Jurnal Aksi Keperawatan dan Kesehatan (JAKK), 2*(1). https://doi.org/10.55018/jakk.v2i1.32

Siregar, R. J. (2022). Factors which influence incident hypertension on pre-elderly. *International Journal of Public Health Education (IJPHE), 1*(2), 117–121. https://doi.org/10.55299/ijphe.v1i2.66

Sukmaningtyas, W., & Utami, T. (2020). Risk factors of hypertension in the elderly. Proceedings of the 1st International Conference on Community Health (ICCH 2019).

Susanto, T., Rasny, H., Susumaningrum, L. A., Yunanto, R. A., & Nur, K. R. M. (2019). Prevalence of hypertension and predictive factors of self-efficacy among elderly people with hypertension in institutional-based rehabilitation in Indonesia. *Kontakt, 21*(1), 14–21. https://doi.org/10.32725/kont.2018.007

Syarli, S., & Arini, L. (2021). Faktor penyebab hipertensi pada lansia: Literatur review. *Ahmar Metastasis Health Journal, 1*(3), 112–117. https://doi.org/10.53770/amhj.v1i3.11

The, F., Hasan, M., Imbar, A., & Dika, S. (2023). The relationship of risk factors to the incidence of hypertension in pre-elderly and elderly (Study in Ternate City). *Journal of Community Development and Advocacy (JCDA), 6*(2), 1–18. https://doi.org/10.32535/jcda.v6i2.2324

Tutpai, G., Unja, E. E., & Nura, F. (2021). Family support for controlling blood pressure of elderly patients in health facilities during the COVID-19 pandemic in Banjarmasin. *KnE Life Sciences.*

Utomo, A. C., & Herbawani, C. K. (2022). Kajian sistematis faktor-faktor risiko hipertensi pada lansia. *Media Kesehatan Masyarakat Indonesia.*

Wahyungingsih, & Astuti, E. (2013). Faktor yang mempengaruhi hipertensi pada usia lanjut. *Journal of Ners and Midwifery Indonesia.*

Widjaya, N., Anwar, F., Sabrina, R. L., Puspadewi, R. R., & Wijayanti, E. (2019). Hubungan usia dengan kejadian hipertensi di Kecamatan Kresek dan Tegal Angus, Kabupaten Tangerang. *Jurnal Kedokteran YARSI, 26*(3), 131–138. https://doi.org/10.33476/jky.v26i3.756

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

Yunanto, R. A., Susanto, T., Rasni, H., Susumaningrum, L. A., & Nur, K. R. M. (2020). Prevalence of hypertension and related factors among older people in nursing home of Jember, East Java, Indonesia. *NurseLine Journal, 4*(2).

Yunita, J., & Sartika, R. A. D. (2022). Overweight/obesity as the dominant factors associated with hypertension in the elderly in Indonesia. *Arterial Hypertension, 25*(4), 152–158. https://doi.org/10.5603/AH.a2021.0017