

The Relationship Between Personality Type (Introvert and Extrovert) and Hypertension in the Productive Age: A Review of Current Literature

Silvia Indrayani¹, Sulistiawati^{2*}, Izzatul Fithriyah³

¹Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia

²Department of Public Health, Universitas Airlangga, Surabaya, Indonesia

³Department of Psychiatry, Faculty of Medicine, Universitas Airlangga
Dr. Soetomo General Academic Hospital, Surabaya, Indonesia

E-mail: silvia.in.yani-2021@fk.unair.ac.id;
sulistiawati@fk.unair.ac.id; izzatul-fithriyah@fk.unair.ac.id

*Corresponding author details: Sulistiawati; sulistiawati@fk.unair.ac.id

ABSTRACT

Background: Hypertension is a situation where the systolic blood pressure is increasing ≥ 140 mmHg and diastolic blood pressure is also increasing ≥ 90 mmHg on two measurements 5 minutes apart in a well-rested or calm state. In general, hypertension is asymptomatic but its morbidity and mortality tend to be high. The higher the blood pressure, the higher the risk of coronary heart disease, heart failure, stroke, and kidney disease. Data from the World Health Organization (WHO) in 2015 showed that around 1.13 billion people in the world have hypertension, meaning that 1 in 3 people in the world are diagnosed with hypertension.

Objective: This literature review explains the current research between personality type and hypertension, highlighting risk factors and prevention. Recent studies have identified key risk factors for hypertension in productive age, including lifestyle, obesity, genetics, stress, and personality type, suggesting a multifactorial pathophysiology that warrants further investigation. **Method:** The method that the researcher used in this study is a non-systematic review that uses database sources from journal publications in ScienceDirect, PubMed, Google Scholar, and WHO. The search utilized keywords such as "Personality type," "introvert", "extrovert", "hypertension", and "Productive age". **Result:** Personality type affects the occurrence of hypertension through a person's response to stress. In previous studies, it was found that introverted personality types have a higher risk of increased blood pressure, so preventive efforts such as stress management and lifestyle modifications are needed to reduce the risk of hypertension, where hypertension can cause life-threatening complications.

Keywords: personality type; hypertension; productive age.

INTRODUCTION

Hypertension is an increase in systolic blood pressure ≥ 140 mmHg and diastolic blood pressure ≥ 90 mmHg on two measurements with an interval of 5 minutes in a state of adequate rest or calm. Increased blood pressure that lasts for a long time (persistent) can cause damage to various organs, which if not detected early and get adequate treatment can further aggravate the situation in people with hypertension. Hypertension often results in acute damage to the microcirculation resulting in multisystem clinical syndromes such as life-threatening cerebral hemorrhage. Many patients with uncontrolled blood pressure and the number continues to increase [1]. Data from the World Health Organization (WHO) in 2015 showed that around 1.13 billion people in the world have hypertension, meaning that 1 in 3 people in the world is diagnosed with hypertension [2].

The prevalence also continues to increase with age, reaching 60% of the population over the age of 60 years. This is related to age as a proxy that allows exposure to various environmental factors that increase blood pressure gradually over time [3].

Hypertension can be caused by several triggering factors such as genetics, age, gender, obesity, nutrition (diet), smoking, stress, lack of exercise, and personality type. Personality consists of several systems working at three levels of consciousness including; the ego working at the conscious level, complex working at the personal unconscious level, and assertive (social communication skills) working at the collective unconscious level. In addition to the systems that work in relation to their respective fields of activity, there are attitudes (introvert - extrovert) and functions (mind-feeling-perception-intuitive) that work at all levels of consciousness [4].

The study of personality focuses on two broad areas. First, it is about understanding how people differ in certain personality characteristics, including interactional abilities or emotional traits. Second, it is about understanding the diverse parts of a person that come together as a whole (American Psychological Association, 2021). Previous studies have found that personality type affects blood pressure elevation. Promotive or preventive efforts are needed to reduce the risk of increasing blood pressure, one of which is stress management. On the other hand, there are also preventive efforts in the form of lifestyle modifications, such as maintaining an ideal body weight, reducing sodium intake, not consuming cigarettes, and alcohol, and exercising diligently.

This literature review aims to explain current research between personality type and hypertension, highlighting risk factors and prevention. It will explore recent advances in health promotion efforts and identify risk factors associated with the condition. As such, this review will help provide insights for the public and health services to reduce the risk of developing hypertension influenced by personality type. In conclusion, this literature review will not only discuss the risk factors and complications of hypertension but also propose preventive measures as a follow-up to solve the existing health problems.

METHOD

The method in this study uses database sources from journal publications in ScienceDirect, PubMed, Google Scholar, and WHO. The search utilized keywords such as "Personality type," "introvert", "extrovert", "hypertension", and "Productive age". This literature can be accessed in full text in PDF format and in peer-reviewed journals. The data collection strategy used was to collect several journals from the internet and highlight a few sentences from each journal found. From these highlights, we organized them into points.

RESULT AND DISCUSSION

Hypertension

• Definition of Hypertension

Hypertension is generally defined by a chronic increase in systemic arterial pressure above a normal threshold value. Hypertension is one of the most common medical diagnoses in the world and is a major risk factor for mortality [3]. Population studies suggest that increased rates of cardiovascular events such as stroke, myocardial infarction, heart failure, atrial fibrillation, and premature death result from an increase in systolic blood pressure ≥ 115 mmHg [5]. Hypertension is generally asymptomatic but its morbidity and mortality tend to be high. The higher the blood pressure, the higher the risk of coronary heart disease, heart failure, stroke, and kidney disease. Thus, by reducing the risk factors that cause hypertension, it can also reduce mortality due to hypertension [6].

• Epidemiology of Hypertension

Hypertension is one of the most common medical diagnoses in the world and is a major risk factor for mortality.

More than 10.4 million deaths each year worldwide result from hypertension. More than one million or approximately 45% of adults worldwide suffer from hypertension, with a consistently high prevalence across all socioeconomic strata. The prevalence also continues to increase with age to reach 60% of the population over the age of 60 years [7]. The incidence of hypertension tends to have a high prevalence in productive age. Ministry of Health of the Republic of Indonesia in 2017, age can be categorized into three groups as follows [8]:

TABLE 1: Classification of Age.

Age	Range
Young age	< 15 years old
Productive age	15-64 years old
Non- Productive age	>65 years old

• Etiology of Hypertension

Blood pressure is recognized as a biomarker for hypertension, but each individual with the same blood pressure level may have different stages of hypertension. Classifications are established based on different stages of hypertension and global cardiovascular risk. Progression is strongly associated with functional as well as structural abnormalities in the heart and blood vessels. Stages of hypertension are used to assess the extent to which elevated blood pressure has progressed at any given time [9]. Based on its cause, hypertension can be divided into primary or essential hypertension and secondary hypertension.

(1) Primary or Essential Hypertension

Primary or essential hypertension is the most common type of hypertension. Hypertension is the most common type of hypertension suffered by hypertensive patients, which is around 90-95% of the population [10]. The exact cause of essential hypertension is not known (idiopathic), while secondary causes of essential hypertension are also not found. In essential hypertension, there is no renovascular disease, renal failure, or other other diseases. Genetic factors, stress, alcohol consumption, smoking, environment, and lifestyle also contribute to the cause of primary hypertension [11]. Primary hypertension is generally characterized by narrowed blood vessels leading to increased cardiac work which is initially characterized by functional and structural changes in the heart or small arteries [9].

(2) Secondary Hypertension

Secondary hypertension can have known causes such as renal vascular abnormalities, thyroid gland disorders (hyperthyroidism), adrenal gland disorders (hyperaldosteronism), and parenchymal diseases [12]. Prevalence of patients with hypertension is less than 1%. Patients with secondary hypertension usually have hypertension that results from the consumption of certain drugs or other causes that or other causes whose effects can increase blood pressure [13]. Secondary hypertension is caused by causes and causes and pathophysiology that can be clearly identified and can be treated with appropriate

pharmacological therapy, so that the management can be well planned in accordance with other underlying diseases [6]. According to Joint National Committee 8 (JNC 8) the classification of hypertension classification is divided into normal, prehypertension, stage 1 hypertension, and stage 2 hypertension [14].

TABLE 2: Classification of Hypertension.

Classification	Systolic Blood Pressure	Systolic Blood Pressure
Normal	<120	<80
Pre-Hypertension	120-139	80-89
Grade 1 Hypertension	140-159	90-99
Grade 2 Hypertension	>169	>100

• Pathophysiology of Hypertension

Hypertension is influenced by the state of blood pressure, including blood volume and cardiac output (the amount of blood pumped by the heart per minute), as well as the balance of arterial tone (the resistance to blood flow, as well as the balance of arterial tone which is influenced by intravascular volume and neurohumoral systems [3]. Systems that play a role in maintaining blood include the baroreceptor system, arterial arteries, body fluid volume regulation, renin-angiotensin system, and vascular Productive age 15-64 years old autoregulation [15]. Thus, if there is an increase in one of these variables will also abnormally affect blood pressure, this is what will cause hypertension [16]. Some of the pathways that cause hypertension are the Renin-Angiotensin-Aldosterone System (RAAS), Endothelium damage, and the sympathetic nervous system pathway [3].

• Risk Factors of Hypertension

Based on information that has been obtained, hypertension is the third leading cause of death in Indonesia and in the world. Hypertension is caused by many factors that influence each other strongly. The situation in each person is of course different, so the factors that cause hypertension are also different in each person. In fact, it is not uncommon for the patient's condition to deteriorate rapidly or continue to be chronic if the risk factors are not addressed. Quickly or continue to become chronic if the risk factors are not reduced. Risk factors for hypertension can be divided into two, namely factors that can be controlled and factors that cannot be controlled. Controllable factors include stress, nutrition, smoking and alcohol consumption, obesity, lack of exercise, and personality type. Uncontrollable factors include genetics, age, and gender [6].

• Management of Hypertension

Hypertension predisposes to cardiovascular complications, and if it is not well managed, it can lead to various serious complications. Non-pharmacological methods that are an integral part of

hypertension management should be initiated in the early phase of the disease and should be continued with medication. Lifestyle modifications include dietary changes such as the reduction of salt, alcohol, and saturated fats, which are nonpharmacological therapies that are often applied. Weight loss (maintaining ideal body weight), increased physical activity, traditional methods such as yoga, acupuncture, mindfulness-based stress reduction, and transcendental meditation have also proven effective. Lifestyle modifications are recommended for all patients with hypertension, as well as for non-hypertensive patients. Some lifestyle modifications that are recommended to lower blood pressure are maintaining ideal body weight, reducing sodium (salt) intake, cessation of cigarette and alcohol consumption, and stress management such as Benson relaxation, muscle relaxation, and deep breathing relaxation [17].

• Personality Type

Personality includes all conscious and unconscious thoughts, feelings, and behaviors. Personality leads a person to be able to adapt to the social and physical environment. In developing a personality, one must strive to maintain unity and harmony among the elements of personality. The study of personality focuses on two broad areas. First, there is the understanding that includes a person's differences in certain personality characteristics, including interactional abilities or emotional traits.

According to Carl Gustav Jung's theory, personality is divided into two: introvert and extrovert. The introverted personality type shows a tendency that the subjective world strongly affects the world that exists within him. An introvert tends to find it difficult to adapt to the outside world, find it difficult to get along and communicate or interact with others, and tend to like to be alone or closed. While the extrovert personality type focuses on thoughts, actions, and feelings that are influenced by the surrounding environment, both social and non-social environments. Extroverts are generally friendly, act as they are, tend to get along easily with others, easily adapt to various unfamiliar situations, and rarely feel worried or uncomfortable. These personality types can be used to distinguish a person's response to the social environment and differentiate the social behavior of each individual. The two personality types also illustrate the uniqueness of each individual's behavior in responding to a stimulus. The uniqueness described is a form of individual response in adapting to the environment, including intellectual, character, temperament, and physical [18].

The Relationship Between Personality Type (Introvert and Extrovert) and Hypertension in the Productive Age

Hypertension can be caused by several triggering factors such as genetics, age, gender, obesity, nutrition (diet), smoking, stress, lack of exercise, and personality type [19]. Personality type can affect the incidence of hypertension, it is seen through a person's stress-coping mechanism [20].

Stress is a psychological factor that contributes to the occurrence of hypertension and heart attack. A person who is experiencing stress can trigger the release of stress hormones such as cortisol which will affect a person's psychological condition [21]. From a psychological perspective, personality is also a factor that can trigger interpersonal conflict. Personality is a dynamic organization of psychophysical systems, which uniquely determines individual behavior and thinking. The relationship between stress and hypertension is caused by sympathetic nerve activity, where these sympathetic nerves work during activity. An intermittent (irregular) increase in sympathetic nerves can cause an increase in blood pressure. If stress continues, it can cause a chronic increase in blood pressure. This includes not only the temporary increase in blood pressure caused by emotional stress but also the chronic hypertension caused by a lifestyle of mental stress. Psychosocial stress is a relatively persistent risk factor for hypertension, as it is usually difficult to modify. The stress response to the same situation is largely different in each individual because it is determined by the integration of personality characteristics, previous experiences, knowledge, and skills [22]. Chronic psychological stress also increases the risk of unhealthy lifestyle behaviors and can lead to hypertension with increased sympathetic nervous system activity, angiotensin II and III also have an inhibitory effect on salt (sodium) secretion, resulting in an increase in blood pressure. The stress response is closely related to the hypothalamic-pituitary function (HPA axis), which is related to the regulation of the hormone cortisol and the sympathetic nervous system, thus affecting heart rate and blood pressure [15].

CONCLUSIONS

The etiology of hypertension is multifactorial. This review showed a significant relationship between personality type and hypertension. Previous studies have found that personality type affects blood pressure elevation, where individuals who have introverted personalities tend to be prone to hypertension. Research also states that people of productive age tend to be prone to hypertension due to high levels of busyness which has an impact on unhealthy lifestyles and increased stressors on these individuals. So health promotion is needed as a preventive effort against increased blood pressure that can be influenced by personality type, namely by maintaining a lifestyle, periodic blood pressure checks, and stress management. However, further research is essential to identify other comorbid diseases that may affect blood pressure elevation, allowing for a more targeted health promotion approach.

ACKNOWLEDGMENT

The authors would like to express their gratitude to all supervisors and various parties who have contributed to the successful completion of this research.

REFERENCES

- [1] Kemenkes Ri 2019. Profil Kesehatan Indonesia Tahun 2019. In: Profil. Kesehatan Indonesia Tahun 2019.
- [2] WHO. World Health Statistic Report 2015. Geneva: World Health Organization; 2015.
- [3] Oparil, S. et al. (2019) 'HHS Public Access. Hypertension.', *Nature Reviews Disease Primers*, 22(4), pp. 1–48. doi: 10.1038/nrdp.2018.14.Hypertension.
- [4] Alwisol. (2018). *Psikologi Kepribadian*. Edisi Revisi. Cetakan 1. Malang: Universitas Muhammadiyah Malang.
- [5] Gabb, G. (2020) 'What is hypertension?', *Australian Prescriber*, 43(4), pp. 108–109. doi: 10.18773/austprescr.2020.025.
- [6] Putri Dafriani (2019) 'Pendekatan Herbal Dalam Menangani Hipertensi', *Berkah Prima*, pp. 1–98.
- [7] Halim, R. and Agung, S. (2022) 'Studi Retrospektif Gaya Hidup Dan Kejadian Hipertensi Pada Usia Produktif', *Journal of Nursing and Public Health*, 10(1), pp. 121–128. doi: 10.37676/jnph.v10i1.2376.
- [8] Ministry of Health of the Republic of Indonesia in 2017
- [9] Giles, T. D. et al. (2009) 'Definition and classification of hypertension: An update', *Journal of Clinical Hypertension*, 11(11), pp. 611–614. doi: 10.1111/j.1751-7176.2009.00179.x.
- [10] Princewel, F. et al. (2019) 'Prevalence and risk factors associated with hypertension among adults in a rural setting: The case of Ombe, Cameroon', *Pan African Medical Journal*, 34, pp. 1–9. doi: 10.11604/pamj.2019.34.147.17518.
- [11] Copeland, I. et al (2018). Understanding the Genetic Etiology of Childhood Onset Essential Hypertension. *Journal of the American College of Cardiology*, 71(11), A581.
- [12] Huang, W. C., Hsu, C. H., Sung, S. H., Ho, W. J., Chu, C. Y., Chang, C. P., Cheng, S. M. (2019). 2018 TSOC guideline focused update on diagnosis and treatment of pulmonary arterial hypertension. *Journal of the Formosan Medical Association*, 118(12), 1584–1609.
- [13] Ali, W., Nathan, S., Funaki, B., Eggener, S., & Bakris, G. (2020). An Unusual Case of Resistant Hypertension Secondary to Fibromuscular Dysplasia. *JACC: Case Reports*, D.
- [14] Muhadi (2016) 'JNC 8 : Evidence-based Guideline Penanganan Pasien Hipertensi Dewasa', *Cermin Dunia Kedokteran*, 43(1), pp. 54–59.
- [15] Udijanti, W. 2011. *Keperawatan Kardiovaskuler*. Jakarta : Salemba Medika.
- [16] Sylvestris, A., 2014. *Hipertensi dan Retinopati Hipertensi*. Volume 10, p. 3. Sainika Medika.

- [17] Verma, N. et al. (2021) 'Non-pharmacological management of hypertension', *Journal of Clinical Hypertension*, 23(7), pp. 1275–1283. doi: 10.1111/jch.14236.
- [18] Alwisol. (2018). *Psikologi Kepribadian*. Edisi Revisi. Cetakan 1. Malang: Universitas Muhammadiyah Malang.
- [19] Kaplan, N.M., & Victor, R.G. (2014). *Kaplan's Clinical Hypertension* (11th ed). Lippincott Williams & Wilkins (LWW).
- [20] Wolff, Hans. P. 2008. *Hipertensi- cara mendeteksi dan mencegah Tekanan Darah Tinggi Sejak Dini*. Jakarta: Buana Ilmu Populer. Gabb, G. (2020) 'What is hypertension?', *Australian Prescriber*, 43(4), pp. 108–109. doi: 10.18773/austprescr.2020.025.
- [21] Rosengren A, Anand SS, Islam S, Franzosi MG, Steyn K, Hussein A et al (2008). Risk factors for myocardial infarction in women and men: insights from the INTERHEART study. *Eur Heart J*. 29(7):932-940.
- [22] Munakata, M. (2018) 'Clinical significance of stress-related increase in blood pressure: current evidence in office and out-of-office settings', *Hypertension Research*, 41(8), pp. 553–569. doi: 10.1038/s41440-018-0053-1.