



## DETERMINANTS OF HYPERTENSION OCCURRENCE

**Gufron Wahyudi<sup>1</sup>, Yoanita Hijriyati<sup>2</sup>**

<sup>1</sup> Bachelor of Public Health Program at Bakti Indonesia University

<sup>2</sup> Bachelor of Nursing Program at Binawan University

Corresponding Email: [gufron.wahyu@yahoo.co.id](mailto:gufron.wahyu@yahoo.co.id)

ABSTRACT	Keywords
Hypertension stands as a primary peril for cardiovascular ailments, potentially culminating in fatalities by inducing complications like heart disease, stroke, and kidney issues. This study scrutinizes the prevalence and risk factors associated with hypertension at Puskesmas Kedungrejo Muncar, Banyuwangi, spotlighting age and body mass index (BMI) as pivotal predictors. Employing a descriptive analytic method with a cross-sectional design, data was gathered through purposive sampling from 64 individuals. Findings unveil a significant correlation between advancing age and hypertension, aligning with previous research attributing this link to deteriorating cardiovascular function and arterial stiffness. Meanwhile, gender and educational attainment emerged as non-significant predictors, contrasting with the notable influence of BMI, with hypertensive individuals often exhibiting a normal BMI. These results accentuate the necessity of comprehending modifiable risk factors like BMI and emphasize the requisite for targeted interventions to combat hypertension in the community. Prevention and management endeavors ought to prioritize age-related considerations and initiatives aimed at fostering healthy BMI levels.	<b><i>Determinant s, Risk factors, Hypertension</i></b>

## INTRODUCTION

Hypertension is a condition where blood pressure is too high, with blood pressure expressed as two numbers, namely systolic which indicates the pressure in the blood vessels when the heart beats, and diastolic which indicates the pressure in the blood vessels when the heart is resting between beats (World Health Organization, 2021). The threshold for hypertension is systolic blood pressure  $\geq 140$  mmHg and/or diastolic blood pressure  $\geq 90$  mmHg in a sufficiently rested state (Republic of Indonesia Ministry of Health, 2013b). The

World Health Organization (WHO) estimates that 1.28 billion adults aged 30-79 years suffer from hypertension, with 46% of them unaware of having hypertension. The highest prevalence of hypertension is in the African region (27%) and the lowest is in the Americas (18%), while the prevalence in the Southeast Asian region is 25% (World Health Organization, 2021).

Hypertension is a primary risk factor for cardiovascular diseases that can lead to fatalities. It can result in complications such as heart disease, stroke,

kidney issues, and other ailments (World Health Organization, 2021).

According to data from the World Health Organization (WHO), approximately 1.13 billion people worldwide suffer from hypertension, indicating that 1 in 3 individuals globally are diagnosed with hypertension, with only 36.8% of them receiving medication. The number of hypertension patients worldwide continues to increase every year. It is estimated that by 2025, there will be 1.5 billion people affected by hypertension, and it is also estimated that every year, 9.4 million people die from hypertension and its complications. In Indonesia, the prevalence of hypertension based on measurements among individuals aged 18 years is 34.1%. Hypertension occurs in the age group of 31-44 years at 31.6%, while in the age group of 45-54 years, it is around 45.3%, and in the age group of 55-64 years, it is 55.2% (Mayasari, 2019).

The findings from the Basic Health Research (Riskesdas) in Indonesia in 2018 indicate that the prevalence of the population with high blood pressure reached 34.11% (Ministry of Health of the Republic of Indonesia, 2018). This figure increased from 2013, where the prevalence of hypertension was 25.8% (Ministry of Health of the Republic of Indonesia, 2013a).

Hypertension is caused by modifiable and non-modifiable factors. Modifiable risk factors include excessive salt and fat intake, lack of physical activity, smoking, alcohol consumption, and obesity. Non-modifiable risk factors include genetics, age, and gender (Ministry of Health of the Republic of Indonesia, 2013b). Hypertension can be prevented by controlling risky behaviors such as smoking, unhealthy diets lacking in fruits and vegetables, excessive consumption of sugar, salt, and fat, obesity, lack of physical activity, excessive alcohol consumption, and

stress (Ministry of Health of the Republic of Indonesia, 2015).

Research conducted by Tumanduk et al. (2019) indicates that gender, dietary patterns, and smoking habits are associated with hypertension. A study by Syamsi (2019) suggests a relationship between family history, fruit and vegetable consumption, and physical activity with the incidence of hypertension. Andika & Safitri (2019) concluded that age, obesity, and family history are risk factors for hypertension.

## METHOD

The research method employed in this study is descriptive analytic method utilizing a cross-sectional study design. Cross-sectional study examines various relationships between risk factors and effects, also known as a cross-sectional study, through observation and direct data collection at a single point in time to determine factors influencing and related to cases of hypertension (Notoatmodjo & Soekidjo, 2018). The sampling technique employed in this study is purposive sampling, where a total of 64 individuals were selected from Puskesmas Kedungrejo Muncar, Banyuwangi.

Data collection technique utilized in the research is a questionnaire consisting of questions addressed to respondents, during which respondents are requested to fill out according to the instructions provided in the questionnaire. Meanwhile, the data analysis utilized both univariate and bivariate analysis, where univariate analysis functions to observe frequency distributions of each independent variable such as age, gender, highest education level, occupation, smoking history, duration of smoking, and body mass index. Bivariate statistical tests examine the relationship between two variables considered associated with the independent variable and dependent variable

(hypertension cases), employing the chi-square statistical test. If  $p$  is less than 0.05,  $H_a$  is accepted, indicating a significant relationship between the two variables, while if  $p$  is greater than 0.05,  $H_o$  is also accepted, signifying no significant relationship between the two variables. Data analysis is computerized using the SPSS method.

RESULTS

Table 1 Frequency Distribution of Respondents Based at Puskesmas Kedungrejo Muncar, Banyuwangi

Respondent Characteristics	N	%
Age	43	67.2
Age Group < 60 Years		
Age Group ≥ 60 Years	21	32.8
Gender		
Female	35	54.7
Male	29	45.3
Education		
Low (Elementary, Junior High, Senior High)	59	92.2
High (Bachelor's Degree)	5	7.8
Body Mass Index		
Normal	40	62.5
Obesity	24	37.5
Hypertension		
Yes	19	29.7
No	45	70.3
Total	64	100

Source: Primary Data

The table presents the frequency distribution of respondents based at Puskesmas Kedungrejo Muncar, Banyuwangi, across various characteristics. Regarding age, the majority of respondents (67.2%) were under 60 years old, while the remaining 32.8% were aged 60 years and above. In terms of gender, there were slightly more female respondents (54.7%) compared to male respondents (45.3%).

When considering education level, a significant proportion of respondents (92.2%) had low educational attainment, ranging from elementary to senior high school, while only a small percentage (7.8%) had achieved a bachelor's degree or higher. Looking at body mass index (BMI), the majority of respondents (62.5%) fell into the normal BMI category, whereas 37.5% were classified as obese. Finally, concerning hypertension status, approximately 29.7% of respondents reported having hypertension, while the majority (70.3%) did not have hypertension. These findings provide insights into the demographic and health characteristics of the respondents at Puskesmas Kedungrejo Muncar, Banyuwangi.

Table 2. The Relationship Between Independent Variables and Hypertension at Puskesmas Kedungrejo Muncar, Banyuwangi

Variable	Hipertention		OR	P Value
	Yes	No		
Age				
Age Group < 60 Years	8	35	4,813	0,005
Age Group ≥ 60 Years	11	10	(1,523- 15.204)	
Gender			0,485	0,189
Female	8	27	(0,163- 1,440)	
Male	11	18		
Education				
Low (Elementary, Junior High, Senior High)	18	41	1,759	0,621
High (Bachelor's Degree)	1	4	(0,183- 16,834)	
Body Mass Index			8,130	0,004
Normal	17	23	(1,679- 39,372)	
Obesity	2	22		

Source: Chi-Square Test

The statistical test results in Table 2 indicate that not all variables are significant predictors of hypertension. The significant

variables are age (p-value=0.005) and body mass index (p-value=0.004). Meanwhile, the variables that are not significant are gender (p-value=0.189) and education level (p-value=0.621).

## DISCUSSION

In this study, it is revealed that age influences the occurrence of hypertension. The elderly age group is mostly affected by hypertension. Typically, hypertension occurs in older age groups. Blood pressure tends to increase starting from the age of 30 to 65, with an average increase of 20 mmHg, and continues to rise by the age of 70 (Hasan, 2018). This finding is consistent with Adam's study (2019), which suggests that advancing age increases the risk of hypertension due to declining cardiovascular function and vascular stiffness. Moreover, aging leads to cellular degeneration, increased arterial pressure, and aortic regurgitation (Widjaya et al., 2019). However, it is worth noting that younger individuals may also develop hypertension. Factors contributing to hypertension in younger age groups include poor lifestyle choices, high-fat diets, genetic factors, obesity, and lack of physical activity (Hasan, 2018).

Based on Table 2, it can be inferred that 42.1% of female respondents have hypertension, while 57.9% of male respondents have hypertension. The research findings indicate that gender does not significantly affect hypertension, with a p-value of 0.189. This finding aligns with the study by Muhammad Yunus and I Wayan Chandra Aditya (2021), which suggests that gender is not associated with the occurrence of hypertension. Although there is no definitive theory explaining why women are at a higher risk of hypertension, postmenopausal women experience an increased incidence of hypertension due to decreased estrogen levels. Estrogen

hormone plays a crucial role in increasing HDL levels, which are essential for maintaining vascular health. Therefore, a decrease in estrogen levels during menopause leads to a reduction in HDL levels, potentially resulting in hypertension. Low HDL and high LDL levels contribute to atherosclerosis, leading to high blood pressure.

According to the research findings, 94.7% of respondents with low education levels have hypertension, while only 5.3% of respondents with high education levels have hypertension. This result is consistent with Podungge's study (2020), which found no association between education and hypertension due to public awareness of healthy lifestyles. Despite having a basic education, respondents can easily access information about hypertension prevention and management through various media channels such as television, the internet, newspapers, and health promotion activities conducted by healthcare professionals. Therefore, although respondents have low education levels, they have sufficient knowledge about health. Sinulingga & Samingan's research (2019) also found no significant relationship between education and hypertension, but there is a tendency for hypertension to occur in individuals with lower education levels due to the influence of education on healthy lifestyles and dietary habits. The higher the level of education, the lower the risk of hypertension, while individuals with lower levels of education are at a higher risk of developing hypertension compared to those with higher levels of education. Thus, it can be concluded that there is no association between education and the occurrence of hypertension at Puskesmas Kedungrejo Muncar, Banyuwangi.

The research findings indicate a relationship between Body Mass Index (BMI) and hypertension, with a p-value of

0.004. The majority of hypertensive patients have a normal BMI. This finding is consistent with Susanto's study (2020), which found that hypertensive patients with a normal BMI are more likely to have stage 1 hypertension. The results showed a p-value of 0.0001, indicating a significant relationship between Body Mass Index (BMI) and hypertension in hypertensive patients. Similarly, Herdiani's study (2019) found a p-value of 0.000, indicating a significant relationship between body mass index and hypertension in the elderly in the Gayungan Surabaya district. Furthermore, previous research indicates a relationship between body mass index and blood pressure. Factors contributing to increased blood pressure include age and body mass index.

## CONCLUSIONS

In this study, it was revealed that age and body mass index (BMI) are significantly associated with the occurrence of hypertension at the Kedungrejo Muncar Health Center in Banyuwangi. Increasing age poses a higher risk of hypertension due to decreased cardiovascular and blood vessel function, as well as stiffening of blood vessel walls. Meanwhile, abnormal body mass index also acts as a risk factor, with hypertensive individuals generally having a normal BMI. However, gender and educational attainment did not have a significant influence on the occurrence of hypertension. Sufficient knowledge about healthy lifestyles can help maintain health even with a lower level of education. Thus, understanding these risk factors can guide efforts in preventing and managing hypertension in the community.

## REFERENCES

- Adam, L. (2019). Determinan Hipertensi Pada Lanjut Usia. *Jambura Health and Sport Journal*, 1(2), 82–89. <https://doi.org/10.37311/jhsj.v1i2.2558>
- Hasan, A. (2018). Korelasi Umur dan Jenis Kelamin dengan Penyakit Hipertensi di Emergency Center Unit Rumah Sakit Islam Siti Khadijah Palembang 2017. *Indonesia Jurnal Perawat*, 3(1), 9–16.
- Herdiani, N. (2019). Hubungan IMT Dengan Hipertensi Pada Lansia Di Kelurahan Gayungan Surabaya. *Medical Technology and Public Health Journal*, 3(2), 183–189. <https://doi.org/10.33086/mtphj.v3i2.1179>
- Kemenkes RI. (2019). Hipertensi Si Pembunuh Senyap. Kementrian Kesehatan RI, 1–5. <https://pusdatin.kemkes.go.id/resource/s/download/pusdatin/infodatin/infodat/hipertensi-si-pembunuh-senyap.pdf>
- Mayasari, M., Waluyo, A., Jumaiah, W., & Azzam, R. (2019). Faktor-Faktor yang Berhubungan dengan Kejadian Hipertensi. *Journal of Telenursing (JOTING)*, 1(2), 344–353. [Online]. Available: <https://doi.org/10.31539/joting.v1i2.849>
- Muhammad Yunus, I Wayan Chandra Aditya, D. R. E. (2021). Hubungan Usia dan Jenis Kelamin Dengan Kejadian Hipertensi Di Puskesmas Haji Pemanggilan Kecamatan Anak Tuha Kab. Lampung Tengah. 8(September), 1–13.
- Notoatmodjo, & Soekidjo. (2018). *Metodologi Penelitian Kesehatan*. Koleksi Buku UPT Perpustakaan Universitas Negeri Malang, 2–7.
- Podungge, Y. (2020). Hubungan Umur dan

- Pendidikan dengan Hipertensi pada Menopause. *Gorontalo Journal of Public Health*, 3(2), 154–161.
- Sinulingga, E. B., & Samingan. (2019). Determinan Kejadian Hipertensi Pada Lansia Di Wilayah Kerja Uptd Puskesmas Jatimulya Kecamatan Tambun Selatan Bekasi Timur. *Jukmas*, 3(1), 35–51.
- Susanto, A. (2020). Hubungan Indeks Massa Tubuh dengan Hipertensi pada Penderita Hipertensi di Puskesmas Kembaran 1 Banyumas. *Jurnal Kesehatan*, 13, 1–19.
- Widjaya, N., Anwar, F., Laura Sabrina, R., Rizki Puspawati, R., & Wijayanti, E. (2019). Hubungan Usia Dengan Kejadian Hipertensi di Kecamatan Kresek dan Tegal Angus, Kabupaten Tangerang. *YARSI Medical Journal*, 26(3), 131.  
<https://doi.org/10.33476/jky.v26i3.756>