NST Proceedings
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Conference Paper

# Prevalence and Factors Associated with Hypertension in the Coastal Community of Laha Village: A Cross-Sectional Study

Etrin Zulqarnain Eka Saputra Linggar, Irwan*, Melda Yunita, Ivanmorl Ruspanah, Augie Desvie Klausya Kadun, Fadila Tri Starlia, Maxwell Landri Vers Malakauseya, Noviyanter Siahaya

Faculty of Medicine, Universitas Pattimura, Ambon 97233, Indonesia

*Corresponding author:*
E-mail:
iwan052@yahoo.com

ABSTRACT

High blood pressure, often known as hypertension, is a worldwide health issue linked to a higher risk of cardiovascular illnesses. Targeted strategies for the prevention and management of hypertension will benefit from an understanding of the prevalence and risk factors for hypertension in particular groups. The purpose of this study was to ascertain the prevalence of hypertension in the coastal community of Laha Village, Ambon City, and to pinpoint the contributing factors. The information came from a 2022 health survey that was carried out in Laha Village's coastline homes. We made use of data gathered from 757 respondents. In this study, concomitant diseases, lifestyle, and demographic status were the independent variables, and hypertension was the dependent variable. The method of multivariate logistic regression was employed for data analysis. We discovered that 6.4% of the residents of Laha Village's coastline community had hypertension. Demographic variables were significantly associated with hypertension, especially in the age ranges of over 60 (aOR=28.18; 95% CI:3.27-242.97; p=0.002) and 41–60 years (aOR=10.09; 95% CI:1.20-84.47; p=0.033). The results showed an interesting correlation between non-smoking (aOR=12.50; 95%CI: 1.54-101.13; p=0.018) and occasional smoking (aOR=13.95; 95%CI: 1.42-136.35; p=0.023) and hypertension. Additionally, a strong correlation was discovered between hypertension and concomitant joint illnesses (aOR=3.03; 95% CI: 1.60-5.70; p <0.001). Our findings imply the need for promoting a healthy lifestyle to reduce the risk of hypertension, particularly among coastal communities. This includes encouraging the adoption of a healthy diet and increased physical activity. Furthermore, our study emphasizes how critical it is to create and carry out community-wide awareness initiatives in Laha Village. The coastal population should be educated about hypertension through these efforts, with a focus on the importance of early detection, routine blood pressure monitoring, and lifestyle adjustments for both management and prevention.

*Keywords: Hypertension, prevalence, factors, coastal community, laha village, cross-sectional study*

## Introduction

Hypertension, characterized by high blood pressure, is a prevalent cardiovascular disease with significant implications for global health. According to Eighth Joint National Committee (JNC 8) Hypertension is defined as persistently high blood pressure, defined as 140 mmHg or higher systolic blood pressure or 90 mmHg or higher diastolic blood pressure. When diagnosing hypertension in adults who are 18 years of age or older, these values are used as the cutoff point (Weber, 2014). It has been reported that hypertension raises the risk of several cardiovascular diseases (Fuchs & Whelton, 2020).

Hypertension is a global health concern, with an estimated 1.28 billion adults aged 30-79 years worldwide affected by the condition, the majority of whom reside in low- and middle-income countries. Alarmingly, an estimated 46% of adults with hypertension are unaware that they have the condition. Additionally, less than half of adults (42%) with hypertension are

diagnosed and receive proper treatment. Moreover, only approximately 1 in 5 adults (21%) with hypertension have their blood pressure under control. These figures demonstrate the critical need for better understanding, identification, and treatment of hypertension to successfully address this pervasive health problem (WHO, 2023). The prevalence of hypertension in Indonesia is 34.1%, which is higher than the 25.8% prevalence of hypertension found in the 2013 Basic Health Research.  In comparison to the prior rate of 24.1% in 2013, the province of Maluku also saw an increase in 2018 of 28.96%. The sociodemographic group that predominates consists of people over 75, women, people without formal education, people without jobs, and people who live in cities. (Direktorat Jenderal Kesehatan Masyarakat, 2019).

There are two primary categories of factors that affect the likelihood of developing hypertension: those that are beyond one's control, like age, gender, genetics, and race, and those that are within one's control, like a low-fiber diet, smoking, inactivity, being overweight, consuming salt, alcohol, and stress. A single risk factor by itself is insufficient to cause hypertension; rather, the presence of multiple risk factors together (a common underlying risk factor) is necessary for the occurrence of hypertension (Direktorat Jenderal Pencegahan dan Pengendalian Penyakit, 2018).

To create focused interventions for public health strategies, it is essential to comprehend the prevalence and contributing factors of hypertension in particular populations. Previous studies have demonstrated that the prevalence of hypertension is higher in women, people living in cities, people with less education, and people without jobs (Begossi, 2013; Peltzer & Pengpid, 2018; Sayeed et al., 2015). Additionally, research has shown that coastal communities have a higher risk of developing hypertension. The high incidence of hypertension observed in these communities has been linked to their substantial intake of dietary salt, especially from salted dry fish, which constitutes a substantial portion of their diet and is high in cholesterol and sodium (Farapti et al., 2017; Sayeed et al., 2015; Widiarsih et al., 2017).

In Laha Village, Ambon City, a survey on disease trends and risk factors was carried out in November. With the use of this data, the study aims to ascertain the prevalence of hypertension in the coastal community of Laha Village and to pinpoint the contributing factors. The study's data came from a health survey that was carried out in 2022 among Laha Village's coastal households

**Material and Methods**
*Data source and survey design*
Data were obtained from a health survey conducted among households in the coastal region of Laha Village in 2022. Data analysis was performed using the multivariate logistic regression method to assess the associations between these variables.

*Study sites and respondents*
Laha Village was chosen for the study because it has been under the direction of the University of Pattimura's Faculty of Medicine. 7,167 people are living in Laha village, which is in Ambon City's coastal region. Community members who volunteered to participate as respondents provided the data collecting. Total sampling was used in the data-gathering process, and respondents from the community who agreed to be interviewed during the data collection period were included. 757 respondents who completed the survey completely provided the data that was used in the research.

*Instruments*
The Basic Health Research 2018 questionnaire created by the Ministry of Health of the Republic of Indonesia served as the basis for the questionnaire that was used. The survey was completed on the Commcare platform, which accepts input from Android-based tablets and smartphones. The questionnaire is written in Bahasa Indonesia and includes questions about co-existing conditions, lifestyle, and sociodemographic characteristics.

### Data collection procedure

Obtaining study permits from the Head of Laha Village and the Faculty of Medicine at Universitas Pattimura was the first step in the data collection process. Students from the Faculty of Medicine at Universitas Pattimura conducted the data collection process for 10 days. They were taking part in the program's community service component.

### Variables

The dependent variable in this study is hypertension. This variable is formed based on whether respondents have been diagnosed with hypertension by a doctor. If respondents answer 'Yes', they will be assigned a code of 1, and 2 as the code for the 'No' answer. The independent variables in this study are divided into three groups sociodemographic characteristics, lifestyle, and coexisting diseases. Sociodemographic characteristics include age (<19 years, 19-40 years, 41-60 years, and >60 years), gender (male and female), and occupation (unemployed/student/homemaker, civil servant/business owner, and farmer or fisherman). Lifestyle characteristics include heavy physical activity (yes/no) and smoking status (every day, not every day, and non-smoker). Heavy physical activity is defined as engaging in intense physical activity continuously for at least 10 minutes every day. Coexisting disease characteristics include central obesity and joint diseases.
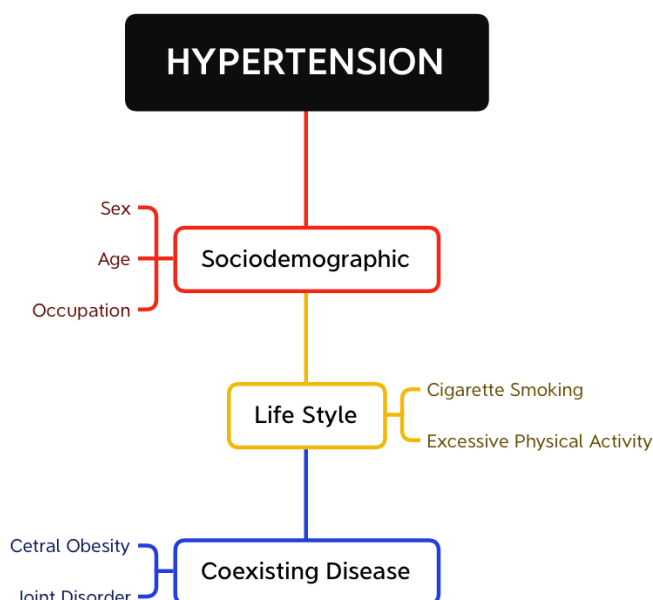


Figure 1. Analytical framework

### Statistical Analysis

Descriptive statistics were employed in the initial phase to assess each variable's distribution that was part of the analysis. The relationship between each independent variable and the dependent variable was then estimated using a bivariate logistic regression, which computed unadjusted odds ratios (OR) for each possible predictor. Ultimately, a multivariate logistic regression was carried out to determine adjusted odds ratios (aOR). STATA/MP 17.0 and Jamovi 2.3.21 were used for data analysis.

### Ethics Clearance

Under reference number 160/FK-KOM.ETIK/VIII/2022, the Faculty of Medicine at Universitas Pattimura provided research ethics for this analysis. After being informed and providing their consent, each person agreed to take part in the study.

## Results and Discussion
### Results

The information gathered from 757 respondents was used in the analysis. We discovered that 6.4% of people in Laha Village had hypertension. Table 1 provides information about the respondents' sociodemographic characteristics, lifestyle, and coexisting disease patterns.

Table 1. Sociodemographic characteristics, lifestyle, and diet of respondents

| Variable | n | % | Hypertension | | p |
|---|---|---|---|---|---|
| | | | n | % | |
| **Sociodemographic Characteristics** | | | | | |
| **Sex** | | | | | |
| Male | 315 | 41.61 | 14 | 4.44 | |
| Female | 442 | 58.39 | 45 | 10.18 | *0.005* |
| **Age (Years)** | | | | | |
| < 19 | 122 | 16.12 | 1 | 0.82 | |
| 19-40 | 334 | 44.12 | 12 | 3.59 | *0.150* |
| 41-60 | 240 | 31.70 | 29 | 12.08 | ***0.006*** |
| > 60 | 61 | 8.06 | 17 | 27.87 | ***< 0.001*** |
| **Occupation** | | | | | |
| Not Working | 382 | 50.46 | 20 | 5.24 | |
| Formal Workers | 115 | 15.19 | 10 | 8.70 | *0.176* |
| Informal Workers | 260 | 34.35 | 29 | 11.15 | ***0.007*** |
| **Life Style** | | | | | |
| **Cigarette Smoking** | | | | | |
| Everyday | 129 | 18.43 | 1 | 0.78 | |
| Not Everyday | 33 | 4.71 | 4 | 12.12 | ***0.012*** |
| Never | 538 | 76.86 | 54 | 10.04 | ***0.011*** |
| **Excessive Physical Activity** | | | | | |
| No | 560 | 59.13 | 24 | 4.29 | |
| Yes | 387 | 40.87 | 37 | 9.56 | *0.097* |
| **Co-existing Diseases** | | | | | |
| **Central Obesity** | | | | | |
| No | 234 | 30.91 | 11 | 0.05 | |
| Yes | 321 | 42.40 | 38 | 11.84 | ***0.005*** |
| Decline to get measured | 202 | 26.68 | 10 | 4.95 | *0.903* |
| **Joint Disorders** | | | | | |
| No | 808 | 91.20 | 36 | 4.46 | |
| Yes | 78 | 8.80 | 25 | 32.05 | ***< 0.001*** |

Table 1 shows hypertension was found mostly in the age group 41-60 years (12.08%), while the least was in the age group <19 years (6.2%). The most sex of the respondents in the study were female (10.18%). The most common types of work are informal workers (11.15%).

### Factors associated with hypertension

The findings of the univariate logistic regression analysis to look at the relationship between lifestyle, co-existing diseases, sociodemographics, and hypertension are shown in Table 2. The

findings indicated that respondents' age and occupation were associated with hypertension based on sociodemographic characteristics. The multivariate analysis's findings, however, indicated that the respondent's age, smoking status, and underlying joint condition all remained strongly linked with hypertension.

Table 2. Factors associated with hypertension in Laha Village Community

| Variable | Univariate | | | | Multivariate | | | |
|---|---|---|---|---|---|---|---|---|
| | OR | (95% CI) | | *p* | aOR | (95% CI) | | *p* |
| **Sociodemographic Characteristics** | | | | | | | | |
| **Sex** | | | | | | | | |
| Male | 1.00 | | | | 1.00 | | | |
| Female | 2.43 | 1.31 | 4.52 | *0.005* | 1.85 | 0.80 | 4.29 | *0.150* |
| **Age (Years)** | | | | | | | | |
| < 19 | 1.00 | | | | 1.00 | | | |
| 19-40 | 4.50 | 0.58 | 35.04 | *0.150* | 2.95 | 0.34 | 25.11 | *0.323* |
| 41-60 | 16.63 | 2.23 | 123.60 | *0.006* | 10.09 | 1.20 | 84.40 | ***0.033*** |
| > 60 | 46.75 | 6.04 | 361.70 | *< 0.001* | 28.18 | 3.27 | 242.96 | ***0.002*** |
| **Occupation** | | | | | | | | |
| Not Working | 1.00 | | | | 1.00 | | | |
| Formal Workers | 1.72 | 0.78 | 3.79 | *0.176* | 1.85 | 0.73 | 4.70 | *0.195* |
| Informal Workers | 2.27 | 1.25 | 4.11 | *0.007* | 1.46 | 0.74 | 2.87 | *0.272* |
| **Life Style** | | | | | | | | |
| **Cigarette Smoking** | | | | | | | | |
| Everyday | 1.00 | | | | 1.00 | | | |
| Not Everyday | 17.65 | 1.90 | 163.85 | *0.012* | 13.95 | 1.42 | 136.38 | ***0.023*** |
| Never | 13.06 | 179.00 | 95.30 | *0.011* | 12.50 | 1.54 | 101.16 | ***0.018*** |
| **Excessive Physical Activity** | | | | | | | | |
| No | 1.00 | | | | 1.00 | | | |
| Yes | 1.58 | 0.92 | 2.71 | *0.097* | 1.85 | 1.00 | 3.43 | *0.050* |
| **Co-existing Diseases** | | | | | | | | |
| **Central Obesity** | | | | | | | | |
| No | 1.00 | | | | 1.00 | | | |
| Yes | 2.72 | 1.36 | 5.44 | *0.005* | 1.71 | 0.79 | 3.70 | *0.175* |
| Decline to get measured | 1.05 | 0.43 | 2.54 | *0.903* | 1.46 | 0.53 | 4.00 | *0.459* |
| **Joint Disorders** | | | | | | | | |
| No | 1.00 | | | | 1.00 | | | |
| Yes | 6.01 | 3.40 | 10.62 | *< 0.001* | 3.03 | 1.60 | 5.70 | ***< 0.001*** |

Our study found that the prevalence of hypertension in the coastal community of Laha Village was 6.4%. After accounting for all other factors, the multiple logistic regression's final model revealed that older age, cigarette smoking, and co-existing joint disorders were associated with hy-

pertension. We discovered that as respondents' ages grew, the likelihood of developing hypertension increased significantly. Compared to younger persons, older people had higher odds of having hypertension. People who didn't smoke had a better probability of having hypertension than those who smoke not every day.

Concerning the sociodemographic component of age, respondents aged >60 years showed the highest odds of developing hypertension (aOR=28.18; 95% CI: 3.27-242.96; p=0.002). Our results on coastal communities have similar findings from another study conducted in coastal communities in Banyuwangi showed that people of older age had a greater risk of hypertension compared to younger ones (Astutik et al., 2020). The prevalence of hypertension increases with age, according to other research as well (Akpan et al., 2015; Buford, 2016; Khajavi et al., 2021; Olack et al., 2015; Peltzer & Pengpid, 2018). The basis for this due that age-related structural changes in the artery wall cause it to stiffen and lose some of its elasticity. Reduced pulsatility of the arterial wall causes a rise in systolic and diastolic blood pressure as a result (Pinto, 2007; Rigaud & Forette, 2001; Sun, 2015).

Relating the prevalence of cigarette smoking in lifestyle, When compared the odds to persons who smoke and do not smoke, the probabilities are higher for those who don't smoke every day (aOR=13.95; 95% CI: 1.42-136.38; p=0.023). Our findings line up with another study carried out in China, which demonstrates that current smokers' adjusted blood pressure was lower than that of nonsmokers and past smokers. Except for pulse pressure, there was no discernible dose-dependent effect of current smoking on blood pressure parameters. The risk of hypertension was dramatically elevated after quitting smoking. However smoking at the time wasn't a risk factor for hypertension (Li et al., 2017).

About the problem of co-existing diseases, we discovered a joint disease-hypertension association (aOR=3.03; 95% CI: 1.60-5.70; p=<0.001). According to a National Health and Nutrition Examination Survey cohort study, there is a strong correlation between hypertension and arthritis, including both RA and OA (Liang et al., 2022). Persistent inflammation is one of the pathophysiological mechanisms that arthritis and hypertension share (Niskanen et al., 2004) also arterial stiffness (Klocke et al., 2003).

## Conclusion

This study's strength was the range of determinants it examined, such as co-existing diseases, individual lifestyles, and demographic traits. The majority of the residents in the coastal communities where we conducted our studies were Moluccans. Our results may be relevant to other similar ethnically populated coastal villages in Indonesia. However, more investigation is needed to look at other coastal regions with distinct ethnic characteristics. 6.4% of people in Laha Village, a coastal community, had hypertension, according to a study done there. According to the results of the multiple logistic regression analysis, co-occurring joint disorders, smoking, and advanced age were all linked to hypertension. The likelihood of acquiring hypertension rose markedly with age, with those over 60 having the highest chance of doing so. Individuals who were daily smokers were more likely to have hypertension than non-smokers. It was also discovered that joint disorders and hypertension were related. The study suggests that aging-related structural alterations in the artery wall, arterial stiffness, and chronic inflammation may all contribute to the development of hypertension. The study also found a connection between smoking and hypertension and joint issues. The study suggests that lifestyle modifications, such as giving up smoking and receiving early diagnosis and treatment for joint diseases, may help lower the risk of hypertension in coastal regions.

## Acknowledgment

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