

Article

# Risk Factors for The Incident of Hypertension in Pre-Elderly (45-59 Years) in The Working Area of The Mano Health Center, East Manggarai District

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## Abstract

**Background :** Mano Health Center is one of the health centers in East Manggarai Regency which has the 1st highest number of hypertension cases out of 29 health centers in East Manggarai Regency. Data on hypertension cases at the Mano Community Health Center in 2023 for the 35-72 age group reached 595 cases. **Objectives:** This study aims to analyze the risk factors for coffee consumption, salt consumption, smoking habits, and alcohol consumption on the incidence of hypertension in the elderly. **Methods:** This type of research is an analytical survey, with a research design *case control*. The sample size was 120 people who were divided into 60 case groups and 60 control groups. Data analysis techniques use statistical tests *Chi-square*. **Results:** The research results show that there is a relationship between coffee consumption (*p-value* = 0.006, OR = 3.406), salt consumption (*p-value* = 0.012, OR = 4.667), smoking (*p-value* = 0.021, OR = 2.688), and alcohol consumption (*p-value* = 0.005, OR = 3.143) with the incidence of hypertension in pre-elderly (45-59 years) in the Mano Community Health Center working area, East Manggarai Regency. **Conclusions:** In conclusion, there is a relationship between coffee consumption, salt consumption, smoking, and alcohol consumption with the incidence of hypertension in the elderly (45-59 years) in the Mano Health Center working area, East Manggarai Regency. The advice that can be given from the results of this research is that it is hoped that it can become a reference for the Community Health Center so that they can provide early prevention efforts through socialization or counseling.

**Keywords:** *Coffee, salt, smoking, alcohol, hypertension*

Academic Editor: Soleman Landi

Received: 12 May 2025

Revised: 26 October 2025

Accepted: 19 January 2026

Published: 23 April 2026

**Citation:** Vancouver Style.

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## 1. Introduction

Hypertension is a non-communicable disease that is still a major health problem in the world. Hypertension is also called the silent killer because it is one of the deadly diseases without any symptoms as a warning for its victims. Hypertension can lead to the onset of coronary heart disease (CHD) and is one of the leading causes of death in the community and tends to increase in the future (Tumanduk, et al, 2019).

Riskesdas data (2018) shows that the prevalence of hypertension has increased from 25.8% to 34.1% with an estimated number of hypertension cases in Indonesia amounting to 63,309,620 people, with 427,218 deaths due to hypertension. The prevalence of hypertension based on the age of the population ≥18 years old (34.1%) is 31-44 years old (31.6%), 45-54 years old (45.3%), and 55-64 years old (55.2%). From the prevalence of hypertension of 34.1%, it is known that 8.8% were

diagnosed with hypertension and 13.3% of people diagnosed with hypertension did not take medication and 32.3% did not regularly take medication. Based on the 2019 NTT Province Non-Communicable Disease case report, the number of hypertension cases was 135,703 cases, in 2020, the number of hypertension cases was 133,203 cases (Maring, et al, 2021).

Data from the Health Office of East Manggarai Regency, (2020) shows that the incidence of hypertension in the population aged  $\geq 15$  years in East Manggarai Regency is 51,809 cases. This number of cases puts hypertension in the first position of non-communicable diseases that occur in East Manggarai Regency. In 2021 the number of cases increased again to 54,026 cases. This data shows that every year the prevalence of hypertension in East Manggarai Regency has increased. Then based on data from the Health of East Manggarai Regency, cases of hypertension in Mano health centers have increased significantly. In 2020 the number of people with hypertension aged  $\geq 15$  years at the Mano Health Center was 3,292 people. In 2021 the number of cases increased to 3,898 people. However, in 2022, the number of cases did not increase and decrease, but the number of cases remained at 3,898 people. From this number of cases, for the last three years the Mano Health Center has occupied the top 3 health centers with the most hypertension patients. This shows that hypertension is a serious problem in Mano Health Center.

Hypertension is a disease that arises due to the interaction of various risk factors that a person has. In general, factors that influence changes in blood pressure are heredity, age, gender, physical and psychological stress, obesity, unhealthy diet, high salt consumption, lack of physical activity, alcohol consumption, caffeine consumption, other diseases and smoking (Sasmalinda, 2013). Risk factors such as coffee consumption play a significant role in increasing blood pressure. Caffeine in the human body works by triggering the production of the hormone adrenaline which comes from adinose receptors in nerve cells which results in increased blood pressure (Wahyuni, 2013; Senior et al, 2021). In a study conducted by Rustamty, et al, (2019), it was found that there was a relationship between consuming coffee and hypertension in pre-elderly in Tambar village, Jogoroto District, Jombang Regency.

Smoking behavior is also one of the causes of hypertension. The nicotine content in cigarettes can cause hypertension (Amalina, et al, 2022). In addition, salt consumption can also cause hypertension. Research conducted by Wahyuningsih & Shanty (2018) on Pre Elderly (45-59 Years) at Posbindu Aster, showed that there was a significant relationship between salt consumption and smoking with the incidence of hypertension.

Another factor that affects hypertension is alcohol consumption. It has also been proven in research that daily alcohol consumption can increase systolic blood pressure by 1.21 mmHg and diastolic blood pressure by 0.55 mmHg for an average of one drink per day. Research conducted by Malonda, et al, (2012), found that alcohol consumption affects the occurrence of hypertension in the elderly in Tomohon City (Malonda, et al, 2012). This study aims to analyze the risk factors that influence the incidence of hypertension in the elderly (45-59 years) at Puskesmas Mano, East Manggarai Regency.

## 2. Materials and Methods

### 2.1. Study Design and Setting

This research is an analytic observational study with a case-control design approach. This study was conducted in the Mano Health Center working area, East Manggarai Regency.

### 2.2. Population and Sampling

The population in this study is divided into case population and control population, where based on data from the East Manggarai Regency Health Office from January to December 2022, hypertension patients aged 45-59 years were 278 people while the control population was people aged 45-59 years who did not experience hypertension amounting to 44,212 people. The sampling technique for cases and controls uses simple random sampling, namely all members of the population have the same opportunity to be sampled. The case sample in this study were pre-elderly (45-59 years) who suffered from hypertension who had examined the Mano Health Center with a total of 60 people. While the control sample in this study were pre-elderly (45-59 years) who did not suffer from hypertension in the Mano Health Center working area with a total of 60 people.

### 2.3. Data Collection

Primary data collection was carried out through interviews with respondents using a questionnaire, as well as measuring blood pressure.

### 2.4. Variables and Operational Definitions

The dependent variable of this study is hypertension while the independent variables are coffee consumption, salt consumption, smoking behavior and alcohol consumption.

### 2.5. Data Analysis

Data were analyzed using the Chi Square Yates' Correlation test and the Odds Ratio calculation to determine the magnitude of the risk. The size of the Odds Ratio value indicates the degree of closeness of the relationship between the variables studied.

### 2.6. Ethical Considerations

State the ethics committee that approved the study and include the approval number.

Confirm that informed consent was obtained from all participants or legal guardians.

### 3. Results

#### 3.1 Respondent Characteristics

Table 1 shows that the distribution of female gender characteristics is more (58.3%) than the distribution of male gender (41.7%). The distribution of abnormal blood pressure (50%) was the same as the distribution of normal blood pressure (50%). The distribution of coffee consumption among at-risk respondents (69.2%) was greater than coffee consumption among non-risk respondents (30.8%). The distribution of salt consumption in respondents who consumed excess salt (84.2%) was greater than the distribution of salt consumption in respondents who did not consume excess salt (15.8%). Then the distribution of smoking habits in respondents who were not at risk (34.1%) was greater than the distribution of smoking habits in respondents who were at risk (65.8%). And the distribution of alcohol consumption in respondents who were not at risk (60%) was greater than the distribution of alcohol consumption in respondents who were at risk (40%).

Table 1. Distribution of Respondents by Gender, Blood Pressure, coffee consumption, salt consumption, smoking habits and alcohol consumption

| Characteristics                | n   | %    |
|--------------------------------|-----|------|
| <b>Gender</b>                  |     |      |
| Male                           | 50  | 41,7 |
| Female                         | 70  | 58,3 |
| <b>Blood Pressure</b>          |     |      |
| Abnormal                       | 60  | 50   |
| Normal                         | 60  | 50   |
| <b>Coffee Consumption</b>      |     |      |
| risky                          | 83  | 69,2 |
| not risky                      | 37  | 30,8 |
| <b>Salt Consumption</b>        |     |      |
| Excess salt consumption        | 101 | 84,2 |
| Not excessive salt consumption | 19  | 15,8 |
| <b>Smoking</b>                 |     |      |
| risky                          | 41  | 34,2 |
| not risky                      | 79  | 65,8 |
| <b>Alcohol Consumption</b>     |     |      |
| risky                          | 48  | 40,0 |
| not risky                      | 72  | 60,0 |

#### 3.2 Risk Factors for Hypertension in Pre-Elderly Population (Aged 45-59 Years) in the Mano Community Health Center Work Area, East Manggarai District

Table 2 of 60 respondents who experienced hypertension, 49 respondents (81.7%) who consumed coffee and 11 respondents (18.3%) who did not consume coffee, while of the 60 respondents who did not experience hypertension there were 34 respondents (56.7%) who consumed coffee and 26 respondents (43.3%) who did not consume coffee. Statistical test results obtained there is a significant relationship between coffee consumption and the incidence of hypertension in pre-elderly with p value (0.006). In table 2 it can also be seen that of the 60 respondents who experienced hypertension, 56 respondents (93.3%) consumed excess salt and as many as 4 respondents (6.7%) who did not consume excess salt, while of the 60 respondents who did not experience hypertension there were 45 respondents (75.0%) who consumed excess salt and as many as 15 respondents (25.0%) who did not consume excess salt. Statistical test results obtained there is a significant relationship between salt consumption and the incidence of hypertension in pre-elderly with p value (0.012).

Table 2 also shows that of the 60 respondents who experienced hypertension, 27 respondents (45.0%) had a smoking habit and 33 respondents (55.0%) who did not have a smoking habit, while of the 60 respondents who did not experience hypertension there were 14 respondents (23.3%) who had a smoking habit and 46 respondents (76.7%) who did not have a smoking habit. Statistical test results there is a significant relationship between smoking habits with the incidence of hypertension in pre-elderly with p value (0.021).

Table 2 also shows that more respondents who received poor family support were not compliant with taking iron tablets (58.3%) while those who received good family support were more compliant with taking iron tablets (81.2%). The statistical test results showed that there was a relationship between family support and compliance of pregnant women in consuming iron tablets with a p-value (0.005). Then in table 2 it can also be seen that of the 60 respondents who experienced hypertension, 32 respondents (53.3%) consumed alcohol and 28 respondents (46.7%) did not consume alcohol, while of the 60 respondents who did not experience hypertension there were 16 respondents (26.7%) who

consumed alcohol and 44 respondents (73.3%) who did not consume alcohol. The results of the statistical test showed a significant relationship between alcohol consumption and the incidence of hypertension in pre-elderly with a p value (0.005).

Table 2. Risk Factors for Hypertension in Pre-Elderly Population (Aged 45-59 Years) in the Mano Community Health Center Work Area, East Manggarai District

| Variable                       | Incidence of Hypertension |      |         |      | Total |      | OR    | p value |
|--------------------------------|---------------------------|------|---------|------|-------|------|-------|---------|
|                                | Case                      |      | Control |      |       |      |       |         |
|                                | n                         | %    | n       | %    | n     | %    |       |         |
| Coffee Consumption             |                           |      |         |      |       |      |       |         |
| Risky                          | 49                        | 81,7 | 34      | 56,7 | 83    | 69,2 | 3,406 | 0,006   |
| Not risky                      | 11                        | 18,3 | 26      | 43,3 | 37    | 30,8 |       |         |
| Total                          | 60                        | 100  | 60      | 100  | 120   | 100  |       |         |
| Salt Consumption               |                           |      |         |      |       |      |       |         |
| Excess salt consumption        | 56                        | 93,3 | 45      | 75,0 | 101   | 84,2 | 4,667 | 0,012   |
| Not excessive salt consumption | 4                         | 6,7  | 15      | 25,0 | 19    | 15,8 |       |         |
| Total                          | 60                        | 100  | 60      | 100  | 120   | 100  |       |         |
| Semoking                       |                           |      |         |      |       |      |       |         |
| Risky                          | 27                        | 45,0 | 14      | 23,3 | 41    | 34,2 | 2,688 | 0,021   |
| Not risky                      | 33                        | 55,0 | 46      | 76,7 | 79    | 60,0 |       |         |
| Total                          | 60                        | 100  | 60      | 100  | 120   | 100  |       |         |
| Alcohol Consumption            |                           |      |         |      |       |      |       |         |
| Risky                          | 32                        | 53,3 | 16      | 26,7 | 48    | 40,0 | 3,143 | 0,005   |
| Not risky                      | 28                        | 46,7 | 44      | 73,3 | 72    | 60,0 |       |         |
| Total                          | 60                        | 100  | 60      | 100  | 120   | 100  |       |         |

#### 4. Discussion

The research findings show that there is a significant relationship between coffee consumption habits and the incidence of hypertension in the elderly in the Mano Health Center working area, East Manggarai Regency. many elderly people who suffer from hypertension consume coffee. Most of the coffee consumed by elderly people with hypertension exceeds two cups of coffee per day. This is evidenced by the answer of more than two cups a day on the questionnaire given.

The amount of coffee consumption among respondents was influenced by several factors, namely: First, the community's habit of using coffee as a treat in traditional rituals. Second, the number of coffee commodities cultivated by the community. Third, the habit of people consuming coffee 3 times or even more a day where every morning, coffee is always served as a complementary drink for breakfast, then in the afternoon coffee is also served as a complementary drink for snacks in the afternoon, and at night coffee is consumed as a drink to help warm the body from cold temperatures at night. The results of this study are in line with research by Firmansyah & Rustam, (2020) which shows that there is a relationship between coffee consumption and blood pressure in hypertension patients at the Pembina Palembang Health Center in 2016 (p-value = 0.020) (Firmansyah & Rustam, 2020).

In this study, it was found that there was a significant relationship between salt consumption and the incidence of hypertension in pre-elderly in the Mano Health Center working area, East Manggarai Regency. Based on the calculation of salt consumption in respondents, it was found that many respondents from the case group had a habit of consuming salt more than 5 grams / day. According to WHO, the limit of salt consumption per day for adults is a maximum of 5 grams / day or less than one teaspoon (Rahadyanti, 2020). The amount of salt consumption carried out by the respondent is due to the habit of consuming vegetables that use salt as a flavoring. In addition, respondents also never abstain from eating side dishes, especially dried fish. This study is in line with research conducted by Purwono et al, (2020) which shows that there is a relationship between salt consumption patterns and the incidence of hypertension in the elderly in the Gadingrejo Health Center Region with p value = 0.010 (Purwono, et al, 2020).

This study also shows that there is a significant relationship between smoking behavior and the incidence of hypertension in pre-elderly in the Mano Health Center working area, East Manggarai Regency. Most respondents who smoke are male. Respondents who smoke have a habit of smoking more than 15 cigarettes per day. Generally, these respondents have been smoking for more than 10 years. The type of cigarette smoked is a mixture of filter and non-filter cigarettes. The brand of cigarette chosen is uncertain depending on the price of cigarettes and the economic condition of the respondent. Each respondent usually smokes more than one brand of cigarette. Each cigarette smoked can increase blood pressure by 7/4 mmHg. So that the number of

cigarettes smoked by the respondent causes an increase in blood pressure to be greater (Medika, 2017).

In this study, it was also found that there was a significant relationship between alcohol consumption and the incidence of hypertension in the elderly in the Mano Health Center working area, East Manggarai Regency. The type of alcohol usually consumed is moke or sopi. The total consumption in a week is more than 30 ml. This is evident from the interview results which show that most of the respondents who drank alcohol answered more than 30 ml in the questionnaire given.

The amount of alcohol consumption among respondents was influenced by several things, namely: First, the habits of the Manggarai people, especially in the Mano Community Health Center working area, where alcohol is used as a treat in traditional rituals or processions. Secondly, alcohol production sites are widespread in the Manggarai area, especially in the Mano Health Center working area. Thirdly, alcohol consumption is not only done by men but also by many women. Excessive alcohol consumption in the community can lead to a decline in health that will disrupt and damage the function of several organs, one of which is the liver, liver function will be disrupted, affecting the performance and function of the heart. Impaired heart function ultimately leads to hypertension. This happens because alcohol stimulates epinephrine or adrenaline which makes the arteries shrink and causes the accumulation of water and sodium (Jayanti, et al, 2017). This study is in line with research conducted by Memah et al, (2019) which shows the results that there is an association between alcohol consumption habits and the incidence of hypertension ( $p$ -value = 0.000) (Memah, et al, 2019).

## 5. Conclusions

Risk factors for hypertension in the elderly (45-59) in the Mano Health Center work area, East Manggarai Regency in 2023, are: coffee consumption, salt consumption, smoking behavior and alcohol consumption.

## 6. Acknowledgments

Thank you to the Head of Mano Health Center and all staff who have allowed researchers to conduct research at the Mano Health Center, South Lamba Leda District, East Manggarai Regency. Thank you also to the respondents who have taken the time to be interviewed. Thank you also to the supervisors who have guided the researchers to complete this research.

## 7. Conflicts of Interest

The authors declare no conflict of interest.

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