

# DETERMINANT FACTORS OF UNCONTROLLED HYPERTENSION AMONG ADULT

Helmi Rumbo<sup>1</sup>

<sup>1</sup>Department of Ners Profession, STIK Indonesia Jaya, Palu, Central Sulawesi  
Correspondence Author: helmi.rumbo@gmail.com

## Abstract:

Uncontrolled high blood pressure can lead to stroke, heart attack, kidney failure, memory and vision disfunction, and also erectile dysfunction. Globally, data shows that 1.28 billion adults aged 30 – 79 years has hypertension and estimated only 46% of adults with hypertension are diagnosed and treated. In Indonesia, based on national survey in 2019, an estimated 34.11% of the population aged 18 years above has hypertension. Division of Disease Control and Environmental health in Central Sulawesi Province proofed that only 0.12 % of hypertensive patients have been recorded to get treatment or visited to the health Center in Parigi Moutong District. This study aims to identify the determinant factors of uncontrolled hypertension among hypertensive patients in Taniuge, Parigi Moutong District. Community-based cross sectional study design was conducted 25 July to 6 August 2021. Total sampling method was used to select 30 sample. Data was collected using the structured questionnaire. Chi-square test was used to identify the relationship between the variables. The results show that, there is relationship between life style and uncontrolled hypertension ( $p = 0.029$ ); there were no relationship between genetic, family support and health center availability and uncontrolled hypertension ( $p = 0.6$ ;  $p = 1.0$ ;  $p = 0.5$ , sequentially). The conclusion is to control blood pressure, patients are recommended to take medication regularly, and also apply the Healthy Living Community Movement (GERMAS). All people are encouraged to adopt a healthy lifestyle, such as not smoking, consuming balanced nutrition, daily physical activity for at least 30 minutes; in order to reduce risk factors for hypertension.

**Keywords:** Hypertension; Uncontrolled; Adult; Life-style

## Introduction

Hypertension or hypertensive patients are often referred to as "silent killers" because the sufferers often do not feel any complaints. High blood pressure is the leading cause of heart disease, kidney failure and stroke in Indonesia. High blood pressure is one of the major risk factors for cardiovascular disease.

Hypertension is defined as systolic blood pressure greater than 140 mmHg and/or a diastolic blood pressure greater than 90 mmHg with repeated inspections.<sup>1</sup> Uncontrolled hypertension is a condition state of systolic blood pressure 140 mmHg and diastolic blood pressure 90 mmHg, based on an average of three measurements in patients with hypertension and with/or without antihypertensive treatment. On the other hand, controlled hypertension is the state of systolic blood pressure <140 mmHg and diastolic blood pressure <90 mmHg in people on antihypertensive treatment.<sup>2</sup> High blood pressure can cause organ damage if not properly identified and treated.<sup>3</sup>

According to 2015 data from the World Health Organization (WHO), approximately 1.13 billion people worldwide have high blood pressure, which means that 1 in 3 people in the world are diagnosed with high blood pressure. The number of people with high blood pressure continues to increase every year. It is estimated that 1.5 billion people will have high blood pressure by 2025, and about 10.44 million people die each year from high blood pressure and its complications.<sup>1,2</sup>

Several factors have been identified that might be contributing beyond hypertensive people control high blood pressure. Non-compliance with antihypertensive therapy and diet to stop high blood pressure (DASH diet), high salt intake, alcohol consumption, smoking, lack of physical activity, stress, overweight / obesity are become of the major contributing factors to uncontrolled

hypertension. Other factors such as Gender, age, duration of illness and other factors comorbidities are also contributed to high blood pressure.<sup>4</sup>

In order to avoid these complications, those diagnosed are expected to improve with hypertension self-care behaviours.<sup>5</sup> Additionally, adherence to treatment is critical to successful management of high blood pressure, further another attempt to maintain blood pressure in adults with high blood pressure is lifestyle changes, including a healthy diet, lower sodium levels, and increased physical activity.<sup>6</sup> On the other hand, the strategies to prevent risk factors for uncontrolled hypertension by adopting healthy lifestyles, regular physical activity, ensuring drug compliance, and prudent dietary practices during early adulthood, also regularly measure blood pressure.<sup>7,8,9</sup>

Globally, it is estimated that 1.28 billion adults between the ages of 30 and 79 have high blood pressure. According to data, only 46% of adults with high blood pressure are diagnosed and treated. In Indonesia, according national survey in 2019, 34.11% of the population over the age of 18 has high blood pressure. Central Sulawesi's Ministry of Disease Control and Environmental Health has reported that only 0.12% of hypertensive patients enrolled for treatment in Puskesmas at Parigi Moutong Regency.<sup>10,11</sup>

Uncontrolled hypertension can increase the risk of cardiovascular events and stroke. According to Blum's Model of Health Determinants, this theory explains some factors that contribute to the overall health of an individual are as follows lifestyle, environment, medical services and heredity. The purpose of this study is to determine the determinants of uncontrolled hypertension in hypertensive patients in Taniuge, Parigi Mutong District.

## Research Method

### Sampling and data collection

This cross-sectional study was carried out at the community-based, conducted from July 25 to August 6, 2021. The population is those who diagnosed with hypertension (33 people), in Taniuge village. Total sampling method was used to select sample, but there were 3 people refuse to participate in this study. The inclusion criteria were those who diagnosed with hypertension; taking hypertension medication. The exclusion criteria, those who were not at home during the

Data were collected by using a structured questionnaire at the participant's house. Those participants were interviewed and clinical measurements were performed. The questionnaire consists of five parts, including socio-demographic factors, lifestyle, environment (family support), medical services, and genetic.

### Tools and measurement

Lifestyle means how people with hypertension do healthy behavior in daily life. The questionnaire consists of 12 items, with Likert scale as the alternative answer. Total score has been categorized as good, moderate and poor.

Environment / family support means how people with hypertension are accompanied and receive support from their families every day. The questionnaire consists of 5 items, with Guttman scale as the alternative answer. Total score has been categorized as support and not support.

Medical services mean the existence / availability of health facilities in the local village, in terms of time, access, transportation, costs and services. The questionnaire consists of 4 items, with Guttman scale as the alternative answer. Total score has been categorized as available and not available.

Genetic means Individuals whose parents / grand parents have hypertension. The questionnaire consists of 2 items, with Guttman scale as the alternative answer. Total score has been categorized as family with hypertension and family with no hypertension.

Hypertension means measurement of tension, after the respondent took a nap at home or in a relaxed condition. Measurements are taken twice; the highest blood pressure will be recorded. The questionnaire consists of 2 items, with Guttman scale as the alternative answer. Total score has been categorized as family with normal (controlled) and not normal (uncontrolled).

## Results

### Univariate analytic

The characteristics of the participants are reported in Table 1, and distribution of blood pressure are reported in Table 2.

**Table 1** Sociodemographic characteristics hypertensive patients

Item	Frequency	Percentage
Age		
Adult (19-44)	2	6.6 %
Middle age (45-54)	9	30 %
Elderly (55-65)	15	50 %
Young Old (66-74)	3	10 %
Old (75-90)	1	3.3 %
Sex		
Male	6	20 %
Female	24	80 %
Education		
Elementary school	16	53 %
Junior high school	12	40 %
Senior high school	1	3.5 %
Bachelor	1	3.5 %
n = 30		

**Table 2** Blood Pressure Measurement

Type	Frequency	Percentage
Normal/ Controlled	6	20 %
Not Normal/ Uncontrolled	24	80 %

n = 30

**Bivariate analytic**

Chi square test was used to identify the relationship between variable. Data show that

only one null hypothesis has been rejected; life style and uncontrolled hypertension are related ( $p = 0.029$ ). There were three null hypotheses has been accepted; Environment and uncontrolled hypertension are not related ( $p = 1.0$ ). Genetic and uncontrolled hypertension are not related ( $p = 0.6$ ). Medical services and uncontrolled hypertension, are not related ( $p = 0.5$ ).

**Table 3** The relationship between life style, internal environment, medical services, genetic and uncontrolled hypertension

Variables	Blood Pressure (Hypertension)		Tot.	$\chi^2$	p	phi
	Uncontrolled	Controlled				
Life style				6.136	0.029	0.452
Poor	20 (66.7 %)	2 (6.7 %)	22			
Moderate	4 (13.3 %)	4 (13.3 %)	8			
Internal Environment				0.536	1.0	0.134
Fair support	2 (6.7 %)	-	2			
Support	22 (73.3 %)	6 (20 %)	28			
Medical Services				0.370	0.5	-0.111
Not available	2 (6.7 %)	1 (3.3 %)	3			
Available	22 (73.3 %)	5 (16.7 %)	27			
Genetic				0.170	0.6	0.075
Family with hypertension	6 (20 %)	2 (6.7 %)	8			
Family with no hypertension	18 (60 %)	4 (13.3 %)	22			

**Discussion**

Worldwide, undiagnosed cases of hypertension and poor control of cases are become the problems facing the health facilities / primary health care.<sup>10</sup> This study revealed that uncontrolled hypertension is greater than controlled hypertension, in the Taniuge Village. Another study proofed that lack of self-awareness and poor control of hypertension were associated with fewer visits of hypertensive patients to PHC.<sup>12</sup> On the other hand, a study shows that the predictors of being undiagnosed and/or uncontrolled are more specific to personal awareness and culture, adherence to lifestyle and therapy, genetic predisposition, socioeconomic level, and the health system in every region and country.<sup>13</sup>

In this study there were three null hypotheses accepted, and only one null hypothesis was rejected. Data shows that internal environment, medical services and genetic are not significant relationship with uncontrolled hypertension; however, lifestyle is significant relationship with uncontrolled hypertension.

Those participants who tend to perform actively smoking cigarette, consume unhealthy diet, rarely do exercise, irregular sleep patterns or lack of sleep are more likely to have uncontrolled hypertension despite the participants being on medication or taking anti-hypertensive drugs.

Behavior is a risk factor for Non-Communicable Diseases (NCD) including less consumption of fruits and vegetables, lack of

physical activity, consumption of salty foods, and smoking. Data shows an increasing in Riskesdas 2013 and Riskesdas 2018: 93.5% in 2013 to 95.4% in 2018. Fewer of people consuming fruits and vegetables can be caused by the increasing number of packaged and fast-food products that tend to be preferred by the community. Further, the percentage of participants who reported smoking increased by 12.3% to 24.3%. The rise of cigarette advertising in the mass media, which is very massive and has been shaping public perceptions in the last decade, which is assumed to have contributed to this phenomenon.<sup>2,10</sup>

According to CDC, unhealthy diet contains of high sodium and low potassium which can lead to high blood pressure. Therefore, implementing the DASH eating plan that proven can helping people to control blood pressure. Getting regular physical activity, could maintain healthy blood vessels and cardiac muscle. Regular physical activity can also help people to keep a healthy weight, which may also prevent complications. Getting enough sleep is important for health, while people not getting enough sleep on a regular basis is more likely to increase risk of heart disease, high blood pressure, and stroke.<sup>10,14</sup>

Furthermore, smoking tobacco can lead to high blood pressure and damage to the heart also blood vessels. Nicotine raises blood pressure, and breathing in carbon monoxide which reduces the amount of oxygen. Cigarettes contain nicotine, which trigger fatty acids to be released, activate platelets, affects atherosclerosis, and narrow the blood vessels. Carbon monoxide can cause anemia. Hemoglobin in the blood is damaged and accumulates in the capillaries, causing thickening of the walls of the blood vessels.<sup>14</sup>

However, some studies show the different results, firstly about association between unawareness of hypertension (and

uncontrolled hypertension) and lifestyle risk factors; which found a significantly higher among current smokers (45.7%) compared with nonsmokers (30.3%) with  $p = 0.005$ . Smokers appeared to have controlled hypertension. About 30% of smokers had uncontrolled hypertension compared with 67.6% among nonsmokers ( $p = 0.003$ ).<sup>12</sup>

Second, about exercise and hypertension; which found was not associated ( $p = 0.051$ ). Those who practice irregularly exercise had controlled hypertension (17 %), compared with those who practice regularly exercise (8 %).<sup>9</sup> Third, a study found that adherence to dietary management and controlled hypertension was not associated ( $p = 0.869$ ); those who implementing healthy diet had uncontrolled hypertension (30%) greater than those who implementing un-healthy diet (22.5%).<sup>4</sup> Some studies found that, hypertensive adults seem to have difficulty avoiding sweet food or salty, because of the culture.<sup>5,15,16</sup>

The management of hypertension is a complex issue.<sup>12</sup> Many determinant factors are interrelated. The factors can be categorized in patient-related factors for compliance preventive and control measures, as well as doctor and health care provider-related factors<sup>17,18</sup> and health facilities, also national system factors.<sup>19</sup>

Lifestyle factors have become increasingly important to the rise in chronic disease. Two behavioral patterns in particular, diet and smoking, have especially powerful effects on the health of individuals and communities. The factors that affect health continues to improve, hence healthcare system must align with research and gain health promotion, to reduce preventable diseases.<sup>20, 21</sup>

One way to control NCDs is to focus on the risk factors associated with these diseases. Low-cost solutions exist for governments and other stakeholders to reduce the common risk

factors associated with climate change. Monitoring progress and trends of non-communicable diseases and their risk is important for guiding policy and priorities. To lessen the impact of NCDs on individuals and society, a comprehensive approach is needed requiring all sectors to collaborate to reduce the risks associated with NCDs, and to promote interventions to prevent and control. Modifiable behaviors risk factors, such as tobacco use, physical inactivity, unhealthy diet, and the harmful use of alcohol, all increase the risk of NCDs.

### Limitations

This study has lack of sample, because the area only one village. In the questionnaire, the author was not identified the history related to health such as comorbid, another disease, and how long with hypertensive.

### Conclusions

The way to control blood pressure, patients are recommended to take medication regularly, and also apply the Healthy Living Community Movement (GERMAS). All people are encouraged to behave a healthy lifestyle, such as not smoking, consuming balanced nutrition, daily physical activity for at least 30 minutes; in order to reduce risk factors of hypertension.

A strategic design of local and national community health is needed, including a screening and prevention program for hypertension, especially for individuals with undiagnosed and uncontrolled hypertension. In addition, it is necessary to promote hypertension as well as government programs on the prevention and management of hypertension. Maximizing promotion via social media, radio, TV, or newspapers to achieve maximum efficiency in preventing non-communicable diseases in populations that tend to have less awareness, and fewer visits to hospitals or health facilities.

Some recommendation for the future research related to this research, as follows: identity the other factors related with hypertension management in PHC, explore the interrelated between individual, family support, and health system program

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