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# FACTORS RELATED TO HYPERTENSION AMONG ELDERLY DURING COVID-19 PANDEMIC

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**ABSTRACT**

Hypertension is a condition where systolic blood pressure is more than 140 mm Hg and diastolic more than 90 mm Hg. Various factors can affect hypertension including sex, obesity and smoking. This study aimed to determine factors related to hypertension in the elderly during the Covid-19 pandemic in the Darmaraja Puskemas 2021 work area. This research was carried out in the village of Darmaraja District Voluntary. This type of research was quantitative research with cross sectional design. The study sample was elderly hypertension with aged 55-65 years as many as 73 respondents. Using the probability sampling technique. The data collection technique used a research instrument in the form of a questionnaire. The data analyzer used is Chi- square with statistic application program.The results showed that the elderly with hypertension showed experienced Grade I hypertension (mild) of 68.5% with a majority of female sex as much as 68.5% and obese by 79.5% and not smoking as much as 52.1% . The result of the statistic test p-value = 0.177(>0.05), that there is no relationship between hypertension and gender. As well as the value of p-value = 0.123(>0.05), that there is no relationship between hypertension and obesity , and p-value = 0.450(>0.05), that there is no relationship between hypertension and smoking.



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## 1. INTRODUCTION

Hypertension is a condition where the systolic blood pressure is more than 140 mmHg and the diastolic is more than 90 mmHg. Hypertension itself can affect anyone, both children, adults and the elderly. Based on WHO data in 2019, it states that the global prevalence of hypertension is as much as 22% of the total population in the world (WHO, 2019). Where the African region has the highest prevalence with hypertension sufferers of 27%, followed by Southeast Asia which occupies the 3rd highest position with a prevalence of 25% (WHO, 2019). Indonesia itself was recorded in 2019, there were 34.11% of hypertension sufferers in Indonesia (Litbangkes, 2019).

In December 2019 the world was shocked by the emergence of a new disease called Coronavirus Disease 2019 (COVID-19). This virus spread so quickly all over the world, including Indonesia, and in March 2020 WHO declared it a pandemic. Severe Acute respiratory Syndrome Coronavirus 2 (SARS-CoV-2) is transmitted from human to human by infecting the respiratory tract through droplets, causing a disease called Coronavirus Disease 2019 (COVID-19). As of the end of May 2021, there were 1,821,703 confirmed positive cases of COVID-19, 11.3% of these cases occurred in the elderly and the highest comorbid disease was hypertension, 50.3% (COVID-19, 2021). Old age and hypertension are among the conditions considered as a co-morbidity of COVID-19, so that it can increase the severity and death rate of a person. This will later be related to abnormalities in the cardiovascular system which will cause the elderly to be susceptible to

blood pressure disorders such as hypertension. This is in line with the results of a study conducted by (Ridwan et al., 2017) which states that the diseases that are commonly experienced by the elderly are diseases of the cardiovascular system, one of which is hypertension. adolescents as much as 13.2%, and 55.2% at the age of 55-64 years, 63.2% at the age of 65-74 years and 69% at the age of 75 years (Rikesdas, 2018).

The magnitude of the incidence of hypertension can be seen in terms of age, the prevalence of youth is 13.2%, and 55.2% at the age of 55-64 years, 63.2% at the age of 65-74 years and 69% at the age of 75 years (Riskesdas, 2018). 8 times, aged 65-69 years 2.45 times and age> 70 years 2.97 times. This is supported by the results of a study by Sudarso et al., (2019) explaining that this cardiovascular disease condition occurs with age where there is a decrease in the elasticity of the walls of the arteries and stiffness in the systemic blood vessels.

The BKKBN explains that the elderly (elderly) is someone who has reached the age of 60 years (Heri, 2019; Padila, 2013). As is the case in other countries in the world, Indonesia is also experiencing an increase in the number of elderly people. In 2019, the number of elderly Indonesians is projected to increase to 27.5 million or 10.3%, and 57.0 million people or 17.9% in 2045 (BPS, 2018). With increasing age, physiological functions decrease due to degenerative processes (aging). The process of aging in humans is a natural event, the loss of the ability of tissues in the body to repair themselves and maintain body functions resulting in a slow decline in body resistance, resulting in a progressive decline in health status and health problems in the elderly in addition to being susceptible to infectious diseases, the elderly are susceptible to non-communicable diseases (Mubarak et al., 2015).

West Java Province is one of the provinces where there are elderly people with hypertension, there are 9,459 elderly people in West Java experiencing hypertension (West Java Health Office, 2019). Sumedang is one of the districts with elderly hypertension, it was recorded that in 2019 as many as 82.96% had hypertension in Sumedang Regency (Sumedang Health Office, 2019). Hypertension in the elderly itself has an impact on sufferers where hypertension can cause the heart to work weakly when pumping blood, and can result in complications such as coronary heart disease, stroke which can cause death (Setyanto, 2017). The Institute for Health Metrics and Evaluation (IHME) in 2017 stated that out of 53.3 million deaths in the world, 33.1% of the causes of death were due to cardiovascular disease (IHME, 2017). Hypertension is a cause of early death, and the longer the problem increases (Setya, 2015). In Indonesia it is stated that as many as 1.7 million deaths in Indonesia are blood pressure (hypertension) of 23.7% (IHME, 2017).

There are many factors that influence the incidence of hypertension including age, gender, obesity, smoking and previous family history. The results of research conducted by Zein, et.al (2015), stated that gender (women) with hypertension is 0.600 with a positive direction. the relationship between the two variables is significant because of the p or sig value. of 0.000 or less than the error rate that we set is 0.05 (5%). meaning that patients aged >50 years and female are 6 times more at risk of developing hypertension, due to the influence of the decreased estrogen hormone due to menopause. In addition, Zein, et.al (2015), stated that the Spearman rank correlation between the variables Family History and Hypertension was 0.355 with a negative direction. The relationship between the two variables is significant because the value of P or Sig. of 0.025 or smaller than the error rate that we set is 0.05 (5%).

This means that patients who positively have a family history of hypertension are 3 times more at risk of developing hypertension. And the Spearman rank correlation between obesity and hypertension is 0.456 with a positive direction. This means that patients with obesity are 4 times more at risk of developing hypertension. Paat (2014). The research was conducted in Motoling Dua Village, Motoling District, South Minahasa Regency. It was found that 53.0% of respondents smoked with a history of hypertension, with the results of the Chi Square statistical test proving that there was a relationship between smoking status and the incidence of hypertension in men aged 40-65 years with a p value = 0.001. Or ≤ 0.05. People with smoking habits are at risk of developing hypertension compared to people who don't smoke, this shows that smoking habits are one of the triggers for hypertension. This is due to other influencing factors such as environmental factors, in this case the community.

The factors that cause hypertension are important to know to prevent unwanted complications caused by these factors. The results of a preliminary study conducted at one of the health centers in Sumedang district, namely at the Darmaraja health center, found that in 2020 there were 2,314 elderly people with hypertension, this was an increase from the previous year, namely 2019, where there were 2,030 elderly people with hypertension. Sukaratu Village is in first place with 273 hypertensive elderly compared to Cieunteung Village, which is 110. Therefore, based on the description above, we see an increasing number of hypertension sufferers from year to year, as well as the impact caused by hypertension. Therefore, researchers are interested in taking research with the title factors related to hypertension during a pandemic in the working area of the Darmaraja Health Center 2022.

## 2. METHOD

The quantitative research method is a research method based on the philosophy of positivism, used to examine certain populations or samples, collecting data using research instruments, analyzing data is quantitative or statistical, with the aim of testing established hypotheses (Sugiyono, 2017). This type of research uses a quantitative method with a Cross Sectional Study design or research with data collection at one time, data relating to independent or risk variables and dependent variables or effect variables, will be collected at the same time (Notoatmodjo, 2010). This study aims to find out what factors are related to hypertension in the elderly during the Covid-19 pandemic in the 2021 Darmaraja Health Center work area. The population in this study were elderly people with hypertension at Posyandu in Sukaratu Village in 2021 which consisted of 4 posyandu, namely Posyandu Kenanga 1 (93 people), Kenanga 2 (85 people), Kenanga 3 (46 people), Kenanga 4 (49 people). So the elderly population with hypertension in Sukaratu village is 273 elderly.

The sample is part of the population that has the same characteristics as the population. The sampling technique in this study is using probability sampling technique. Probability sampling is a sampling technique that provides equal opportunities for each element (member) of the population to be selected as a member of the sample (Sugiyono, 2017). The results of calculations based on the Slovin formula, the number of samples obtained is 73 with a confidence level of 10%. The number of stratified sample members (literary) is carried out by means of proportional random sampling. Test the reliability of the questionnaire that has been tested in Noerinta (2018), seen from the value of Cronbach's Alpha with a significance level of 5%. The questionnaire is said to be reliable if the Cronbach's Alpha value is > 0.60. The results of the reliability test of the questionnaire Factors Influencing the Incidence of Hypertension in the Elderly show a Cronbach's Alpha value of 0.661 > 0.60, this means reliable.

## 3. RESULTS AND DISCUSSION

### 3.1. Results

#### 3.1.1 Distribution of Hypertension Frequency in the Elderly

Table 1.
Distribution of Hypertension Frequency in the Elderly in Sukaratu Village (n=73).

| Hypertension | f | % |
|---|---|---|
| Grade I (mild) | 50 | 68,5 % |
| Grade II (moderate) | 23 | 31,5% |
| **Total** | 73 | 100,0% |

Based on table 1 it can be seen that the majority of the elderly in Sukaratu village suffer from Grade I Hypertension (mild) as much as 68.5% (50 respondents).

#### 3.2.2 Relationship between Gender and Hypertension in the Elderly

Table 2.
Relationship between Gender and Hypertension in the Elderly (n=73)

| Hypertension | Gender | | | | Total | | *p – value* |
|---|---|---|---|---|---|---|---|
| | Woman | | Man | | | | |
| | f | % | f | % | f | % | |
| Grade I | 37 | 50,7% | 13 | 17,8% | 50 | 68,5 % | 0,177 |
| Grade II | 13 | 17,8% | 10 | 13,7% | 23 | 31,5% | |
| **Total** | **50** | **68.5%** | **23** | **31,5%** | **73** | **100 %** | |

Based on table 2 above, it can be seen that the majority of elderly suffer from hypertension more women than men, namely 68.5% (50 respondents) are elderly women, and most are in grade I as much as 50.7% (37 respondents) and the number of elderly men who suffer from hypertension is equal to 31.5% (23 respondents) and most are in grade I as much as 17.8% (13 respondents). While the p-value = 0.177, which means that the p-value is greater (> ) than the value a = 0.05 so that Ha is rejected and Ho is accepted, it can

be concluded that there is no relationship between gender and hypertension in the elderly in Sukaratu village, Darmaraja sub-district 2022.

### 3.2.3 The Relationship between Obesity and Hypertension in the Elderly

Table 3.
The Relationship between Obesity and Hypertension in the Elderly (n=73)

| **Hypertension** | **Body Mass Index** | | | | **Total** | | ***p – value*** |
|---|---|---|---|---|---|---|---|
| | IMT < 25 | | IMT > 25 | | | | |
| | f | % | f | % | f | % | |
| Grade I | 13 | 17,8% | 37 | 50,7% | 50 | 68,5 % | 0,123 |
| Grade II | 2 | 2,7% | 21 | 28,8% | 23 | 31,5% | |
| **Total** | **15** | **20,5%** | **58** | **79,5%** | **73** | **100%** | |

Based on table 3 it can be seen that the majority of the elderly in Sukaratu Village have a body mass index of more than 25, which means they are obese 79.5% (58 respondents), and most are in grade I as much as 50.7% (37 respondents). Meanwhile, the p-value = 0.123, which means that the p-value is greater (>) than a = 0.05, so that Ha is rejected and Ho is accepted. So it can be concluded that there is no relationship between obesity and hypertension in the elderly in Sukaratu Village, Darmaraja District.

### 3.2.4 The Relationship between Smoking and Hypertension in the Elderly

Table 4.
The Relationship between Smoking and Hypertension in the Elderly in Sukaratu Village (n=73)

| **Hypertension** | **Smoking** | | | | **Total** | | ***p – value*** |
|---|---|---|---|---|---|---|---|
| | Yes | | No | | | | |
| | f | % | f | % | f | % | |
| Grade I | 22 | 30,1% | 28 | 38,4% | 50 | 68,5 % | 0,450 |
| Grade II | 13 | 17,8% | 10 | 13,7% | 23 | 31,5% | |
| **Total** | **35** | **47,9%** | **38** | **52,1%** | **73** | **100%** | |

Based on table 4 it can be seen that the majority of elderly respondents as much as 52.1% (38 respondents) elderly in Sukaratu village do not smoke and most are in grade I as much as 38.4% (28 respondents). Meanwhile, as many as 47.9% (35 respondents) of the elderly in Sukaratu Village smoked and most of them were in grade I as much as 30.1% (22 respondents). Meanwhile, it can be seen that the p-value = 0.450, which means that the p-value is greater than a = 0.05, so that Ha is rejected and Ho is accepted. So it can be concluded that there is no relationship between smoking and hypertension in Sukaratu Village, Darmaraja District.

### 3.2.5 Relationship between Age and Hypertension in the Elderly

Table 5.
Relationship between Age and Hypertension in the Elderly in Sukaratu Village.

| **Hypertension** | **Age (years)** | | | | **Total** | | ***p – value*** |
|---|---|---|---|---|---|---|---|
| | 55-60 | | 61-65 | | | | |
| | f | % | f | % | f | % | |
| Grade I | 36 | 49.3% | 14 | 19.2% | 50 | 68,5% | 0,035 |
| Grade II | 10 | 17,8% | 13 | 13,7% | 23 | 31,5% | |
| **Total** | **46** | **63%** | **27** | **37%** | **73** | **100 %** | |

Based on table 5, it can be seen that the majority of elderly respondents, 63% (46 respondents) in Sukaratu village, are in the range of 55-50 years and most are in grade I, 49.3% (36 respondents). While 37%

(27 respondents) of the elderly in Sukaratu Village are in the age range of 61-65 years and most are in grade I as much as 19.2% (14 respondents). While it can be seen that the p-value = 0.035, which means that the p-value is smaller than a = 0.05 , so that Ha is accepted and Ho is rejected. So it can be concluded that there is a relationship between age and hypertension in Sukaratu Village, Darmaraja District.

### 3.2. Discussion

#### 3.2.1 Description of hypertension in the elderly

The Join National Committee in The Eighth Report of Join National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure states that high blood pressure (hypertension) is a condition in which a person's blood pressure is ≥140 mmHg (systolic) and/or ≥ 90 mmHg (Ministry of Health, 2018). The results of this study showed that as many as 68.5% or as many as 50 elderly in Sukaratu Village experienced Grade I (mild) hypertension and as many as 31.5% or as many as 23 elderly in Sukaratu Village experienced Grade II (moderate) hypertension. This study is in line with the results of research conducted by Sri Agustina (2014), the results of which stated that elderly people with hypertension suffer more from Grade I (mild) hypertension, namely 70.1% or 61 elderly respondents have Grade I hypertension (mild).

It can also be seen that in this study the age characteristics of the respondents were 22 respondents (30.1%) elderly aged 56 years or more. Research conducted by Gonidjaya (2021) shows as much as 63.2%.

Most of the elderly experience hypertension at the age of 56-65 years, where it is clear that the risk of hypertension increases with age. This is also in line with the results of a study conducted by Tumanduk WM, et al (2017), which stated that the age group 56-65 years experienced the most cases of hypertension, 33 cases (43.8%). Increasing age causes physiological changes in the body such as thickening of the arterial walls, so that the blood vessels experience narrowing and become stiff, so that arterial pressure increases and degenerative processes occur with age (Widjya, 2019). The link between the pandemic and high blood pressure goes both ways. Basically people with high blood pressure are at higher risk of getting covid and also the possibility of complications is high. Patients do not dare to go to the hospital for examination, so if there are complaints that are not so severe they will buy medicine at the pharmacy without knowing their blood pressure (Suprayitno & Wahid, 2019). This is very worrying because uncontrolled blood pressure can cause other complications such as stroke (Suprayitno & Huzaimah, 2020).

Cases of the incidence of COVID 19 in Indonesia are still increasing with the highest death rate in the world (Handayani, Hadi, Isbaniah, Burhan, & Agustin, 2020). This makes people worried, anxious, confused and stressed so that it affects health (Afifah, 2020). People are afraid to check their health conditions in hospitals, clinics and puskesmas with the reason they are afraid of contracting COVID-19, so many diseases are not well controlled, one of which is hypertension.

#### 3.2.2 Relationship between Gender and Hypertension in the Elderly

Gender is one of the factors that cannot be changed. The results of the study regarding the relationship between gender and hypertension in the elderly in Sukaratu Village showed that the number of women suffering from hypertension was more, namely 68.5% (50 respondents) and the number of elderly men suffering from hypertension was equal to 31.5% (23 respondents). The results of the chi-square statistical test obtained a p-value = 0.177, which means that the p-value is greater (> ) than the value a = 0.05 so that Ha is rejected and Ho is accepted. It can be concluded that in this study there is no relationship between gender and hypertension in the elderly in Sukaratu village, Darmaraja sub-district 2022.

The results of this study are in contrast to the results of a study conducted by Miftahul (2019), which stated that there is a relationship between the incidence of hypertension in the elderly and gender. As well as the results of this study are not in line with the opinion of Aristotle (2018) which states that men tend to suffer from hypertension more than women. This happens because men have an unhealthy lifestyle when compared to women. This is caused by hormonal changes experienced by postmenopausal women. Men often experience signs of hypertension in their late thirties, whereas women often experience hypertension after menopause.

Women's blood pressure, especially systolic, increases more sharply with age. After 55 years, women do have a higher risk of suffering from hypertension. One of the causes of this pattern is the difference in hormones of the two sexes. The production of the hormone estrogen decreases at menopause, women lose its beneficial effect so that blood pressure increases. The prevalence of hypertension in men is almost the same as women, but women are protected from cardiovascular disease before menopause, women who have not experienced menopause are protected by the hormone estrogen which plays a role in increasing levels of High Density Lipoprotein (HDL). High levels of HDL cholesterol are a protective factor in preventing atherosclerosis. The protective effect of estrogen is considered as an explanation for the presence of female immunity at premenopausal age (Aristotle, 2018).

However, the results of this study are in line with the results of a study conducted by Yunus (2021), which states that there is no relationship between hypertension in the elderly and gender. This is because the incidence of hypertension in men and women does not show a significant difference in terms of the number of events.

The results of this study are in agreement with previous research by Novitaningtyas (2014) in Makamhaji Village, Kartasura District, Sukoharjo Regency with the result that there is no statistical relationship between gender and the incidence of hypertension. Research by Supriyono & Andriyanto (2020) on healthy training participants with the result that gender has no relationship with the incidence of hypertension.

Although statistically there is no significant relationship between hypertension and gender, descriptively it is clear that women suffer from hypertension more than men. The absence of a relationship between gender and the incidence of hypertension in Sukaratu Village is possible because the number of hypertensive patients in women and men is not much different or in other words between men and women have the same opportunity to experience hypertension. Based on these results, even though there is no significant relationship, health promotion must still be given to both male and female patients related to the dangers and risks of hypertension as a prevention effort considering that both have the same risk of experiencing hypertension.

**3.2.3 Relationship between Body Mass Index and Hypertension in the Elderly**

Obesity is a complex and multifactorial disease characterized by excess BMI of more than or equal to 25 due to excessive accumulation of fat in the body. Obesity is caused by an imbalance between the amount of energy received and the amount of energy expended so that the body weight becomes heavier than the ideal body weight due to the accumulation of fat in the body (Wijaksana, 2016). It can be seen that 79.5% (58 respondents) of the elderly in Sukaratu Village have a body mass index of more than 25 which means they are obese. Meanwhile, 20.5% (15 respondents) of the elderly in Sukaratu Village have a body mass index of less than 25. while the p-value = 0.123, which means that the p-value is greater (>) than a = 0.05, so Ha is rejected and Ho is accepted. So it can be concluded that there is no relationship between obesity and hypertension in the elderly in Sukaratu Village, Darmaraja District.

The results of this study are not in line with the results of research conducted by Kartika (2020), which states that there is a significant relationship between hypertension and obesity in the elderly. Another study conducted by Mustolih (2015) concluded that there is a significant relationship between obesity and the incidence of high blood pressure. This is due to an increase in heart performance in people who are obese so that blood volume and pressure on the arterial walls increase.

However, the results of this study are in line with the results of a study conducted by Rohkuswara (2017), which stated that there is no relationship between obesity and hypertension in the elderly. This was also reinforced by research conducted by Arifin (2016) which stated that the number of elderly people with hypertension with a BMI of more than 25 was higher, but when the chi-squere test was carried out, the result was p = 0.271 (P > 0.05), meaning that there is no relationship between hypertension and obesity in the elderly with hypertension. This research is in line with research conducted by Gonidzo (2021). In that study, the results obtained were p=0.160 (P>0.05) so that there was no significant relationship between obesity and the incidence of hypertension in the elderly. The condition of the COVID-19 pandemic is one of the reasons why PTM risk factors cannot be controlled due to limitations in conducting regular health checks for fear of contracting it.

However, even though seen from the statistical results there is no relationship between obesity and the incidence of hypertension in the elderly, when viewed from a descriptive perspective, it seems clear that most of the elderly with hypertension in Sukaratu Village are obese or overweight (BMI > 25). The absence of a relationship between obesity and hypertension may be due to research limitations or other influencing factors such as nutritional intake, lifestyle and one thing is the renin-angiosteine system. The system is closely related to sodium, which in this study these factors were not examined. In the blood renin converts angiostinogen to angiostenin. This angiotensin can cause the diameter of blood vessels to shrink. While renin will trigger the production of aldosterone which functions to regulate extravascular fluid expenditure. This will cause sodium in the blood to increase, thus causing blood volume to rise and that automatically causes blood pressure to increase. According to Olack (2015), it is known that the average case of hypertension has decreased blood pressure by reducing salt intake. The condition of the COVID-19 pandemic has caused various changes such as an increased risk of increasing obesity or Body Mass Index (BMI) due to an imbalance between food intake and physical activity and causing uncontrolled blood pressure.

**3.2.4 Relationship between Smoking Behavior and Hypertension in the Elderly**

The risk factors for hypertension, in general, are divided into risk factors that can be controlled or changed (changeable), such as obesity, lack of exercise, smoking, and consumption of alcohol and salt and which cannot be controlled or cannot be changed (unchangeable). Smoking is one of the factors that causes hypertension, but these factors can be changed. it can be seen that as many as 52.1% (38 respondents) of the elderly in Sukaratu village do not smoke. while 47.9% (35 respondents) of the elderly in Sukaratu Village smoked. Meanwhile, it can be seen that the p-value = 0.450, which means that the p-value is greater than a = 0.05, so that Ha is rejected and Ho is accepted. So it can be concluded that there is no relationship between smoking and hypertension in Sukaratu Village, Darmaraja District.

The results of this study are not in line with the results of a study conducted by Setyanda (2015), which states that there is a relationship between the incidence of hypertension and smoking habits in the elderly. As well as research conducted by Paat (2015), states that smoking is related to the incidence of hypertension in the elderly. Tobacco in cigarettes contains more than 4,000 chemical substances that are closely related to heart disease, lung disease, cancer, infertility, hypertension, ISPA and a number of other diseases.

Tobacco in cigarettes is closely related to hypertension, this is because cigarettes contain nicotine which can cause blood pressure to increase. The more a person consumes cigarettes in a day, the greater the chance of suffering from hypertension. The main ingredients in tobacco include nicotine, tar, carbon monoxide, even radioactive substances such as 210Pb and 210Po which, although found in small quantities, can accumulate in the body, as well as other harmful substances. The nicotine found in cigarettes triggers the hormone adrenaline which causes blood pressure to increase. Nicotine and other harmful substances are absorbed by the blood vessels into the lungs and circulated throughout the rest of the bloodstream, causing narrowing of the blood vessels. This causes the work of the heart to increase to pump blood throughout the body through narrow blood vessels (Suprihatin, 2016).

Nonetheless, the results of this study are in line with the results of research conducted by Musni (2019). The results of his research stated that there was no relationship between smoking and hypertension in the elderly with a p-value of 0.390 (P > 0.05). There is no significant relationship between hypertension and smoking, one of which is due to the respondent factor that the majority of respondents do not smoke are greater than respondents who smoke. The results of this study are also in line with the results of a study conducted by Puspita & Haskas (2014), in hypertensive patients who were treated at the Labuang Baji Hospital polyclinic in Makassar, showing that smoking is not associated with the incidence of hypertension. Meanwhile, the results of research by Sukma (2019) Pebriyandini (2015), Hamzah (2019) and Siswanto (2020), show that there is no relationship between smoking behavior and the incidence of hypertension. This is supported by several elements in their research. First, when viewed from the research subjects in the literature based on the characteristics of the respondents, the majority are female. Second, from the results of interviews with respondents in the literature, that the majority of respondents who are female tend not to smoke. Where this is the same and in line with this study, when viewed from the statistical test it is indeed unrelated, but when viewed from the descriptive it is clear that most of the respondents are women and most of the female respondents do not smoke.

Although the results of the study showed that there was no relationship between smoking behavior and the incidence of hypertension, this could occur due to research limitations such as being influenced by other factors such as nutritional status. An unbalanced nutritional status will cause health problems for the body, high levels of fat in the blood will lead to narrowing and blockage of the blood vessels and if this continues to happen, the work of the heart will pump extra blood to supply blood needs to the tissues, resulting in an increase in blood pressure. Stress levels, stress is related to increased sympathetic nerve activity so that it can trigger blood pressure. age, as people get older, the walls of blood vessels become stiffer so that it contributes to increasing blood pressure in older age groups. Excessive salt consumption also contributes to the prevalence of hypertension because high salt content in the body will increase cerebrospinal fluid and sympathetic nerve activity (Rosdiana, 2019).

**3.2.5 Relationship between Age and Hypertension in the Elderly**

Risk factors for hypertension, in general, are divided into risk factors that can be controlled or modified and those that cannot be controlled or cannot be changed. Age is one of the factors of hypertension that cannot be changed. The results showed that the majority of elderly respondents were 63% (46 respondents). The elderly in Sukaratu village were in the range of 55-50 years and most were in grade I, 49.3% (36 respondents). While 37% (27 respondents) of the elderly in Sukaratu Village are in the age range of 61-65 years and most are in grade I as much as 19.2% (14 respondents). While it can be seen that the p-value = 0.035, which means that the p-value is smaller than a = 0.05 , so that Ha is accepted and Ho is rejected. So it can be concluded that there is a relationship between age and hypertension in Sukaratu Village, Darmaraja District.

The results of this study are not in line with the results of a study conducted by Wicaksono (2019), stating that there is no significant relationship between age and the incidence of hypertension in the elderly. It

can be seen that the p-value shows 0.094 where the p-value is greater than a = 0.05. In addition, the research conducted by Wicaksono (2019) is in line with the results of research conducted by Milss et al (2016), which stated that there was no significant relationship between age and the incidence of hypertension in the elderly and the elderly who routinely control blood pressure.

However, the results of this study are in line with the results of a study conducted by Nuraeni (2019), stating that there is a significant relationship between age and the incidence of hypertension in the elderly. Based on the results of a study where the elderly group of 55-65 years had the highest percentage of suffering from hypertension, in this case the researchers concluded that the older a person is, the more at risk of experiencing hypertension. Researchers assume that this is because as a person ages, there is a decrease in the ability of the body's organs including the cardiovascular system, in this case the heart and blood vessels. The blood vessels become narrower and the walls of the blood vessels stiffen, causing blood pressure to increase. This is in line with the theory that increasing a person's age increases the risk of developing hypertension. This occurs because in old age the large arteries lose their flexibility and become stiff so that blood is forced to pass through narrower blood vessels than usual and results in an increase in blood pressure (Hartanti & Mifbakhuddin, 2015).

The high hypertension in line with increasing age, is caused by structural changes in the large blood vessels, so that the lumen becomes narrow and the blood vessel walls become more rigid, as a result is an increase in systolic blood pressure. With increasing age, there is an increase in average diastolic blood pressure, although not so significant, there is also an increase in the prevalence of hypertension for each decade of age group (Sartik, Tjekyan, & Zulkarnain, 2017). The results of this study are in line with previous research from Ningsih & Indriani (2017) on respondents to Beringharjo market workers in Yogyakarta City, who obtained the result that age is related to the incidence of hypertension (p = 0.000), Odds Ratio (OR = 15.706, 95% CI 3.615-68.230), meaning that the older a person is, the more likely he is to experience 15.7 times more severe hypertension. The higher the age, the higher the risk of experiencing an increased degree of severity of hypertension. This is caused by the degenerative process that occurs in the elderly.

## 4. CONCLUSION

Based on the results of the research and discussion described in the previous chapters, the conclusions that can be drawn from this research are:

1. The majority of elderly hypertension is in the mild grade (68.5%)
2. The majority of the elderly who suffer from hypertension in Sukaratu Village are female (68.5%), have a BMI > 25 (79.5%), and most of the elderly do not smoke (52.1%). As well as the age of elderly people with hypertension in Sukaratu Village, which is in the range of 55-60 years (49.3%).
3. There is a relationship between age and hypertension in the elderly in Sukaratu Village, Darmaraja District 2022. However, there is no relationship between gender, obesity and smoking habits in the elderly and hypertension in Sukaratu Village, Darmaraja District 2022, but there is a relationship between age and hypertension in the elderly in Sukaratu Village, Darmaraja District 2022.

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