

The Correlation Between Smoking Behavior and The Use of “Used Cooking Oil” with Hypertension Incidences at Malimbu Coastal Area

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Abstract

Hypertension is the main risk factor that leads to cardiovascular disease such as heart attack, heart failure and stroke, which is the highest cause of death in the world. One area with high risk of hypertension is the coastal area. The famous coastal area in the Lombok is Malimbu, located in North Lombok, West Nusa Tenggara Province. This research is an analytical observational study with a cross sectional design. This study aims to determine the correlation between smoking behavior and use of “used cooking oil” and the incidence of hypertension. Samples in this study were 70 people (n=70), and was taken using accidental sampling technique. Data were analyzed using chi-square. The results showed that the incidence of hypertension was 48% of the 70 respondents. Most of the respondents (70%), had no history of hypertension in their family. This research shows that there is no correlation between smoking behavior and the incidence of hypertension (p=0.807) with PR=1.156 (0.354 - 3.797). The use of “used cooking oil” was also found to be not correlated with the incidence of hypertension (p=0.632) with PR=1.275 (0.486 - 3.345). Although several previous studies showed that the smoking behavior and the use of used cooking oil correlate to hypertension, but this study result shows different data. This can be caused by other factors. Future research needs to examine the characteristics of smokers that may be related to the incidence of hypertension.

Keywords: Used Cooking Oil; Smoking; Hypertension; Coastal Areas; risk factor

Hipertensi merupakan faktor risiko utama yang menyebabkan penyakit kardiovaskular seperti serangan jantung, gagal jantung, dan stroke yang merupakan penyebab kematian tertinggi di dunia. Salah satu daerah yang mempunyai risiko tinggi terkena hipertensi adalah daerah pesisir. Kawasan pantai yang terkenal di Lombok adalah Malimbu yang terletak di Lombok Utara, Provinsi Nusa Tenggara Barat. Penelitian ini merupakan penelitian observasional analitik dengan desain cross sectional. Penelitian ini bertujuan untuk mengetahui hubungan perilaku merokok dan penggunaan “minyak jelantah” dengan kejadian hipertensi. Sampel dalam penelitian ini berjumlah 70 orang (n=70), dan diambil dengan menggunakan teknik *Accidental Sampling*. Data dianalisis menggunakan chi-square. Hasil penelitian menunjukkan kejadian hipertensi sebesar 48% dari 70 responden. Sebagian besar responden (70%) tidak memiliki riwayat hipertensi dalam keluarganya. Penelitian ini menunjukkan bahwa tidak terdapat hubungan antara perilaku merokok dengan kejadian hipertensi (p=0,807) dengan PR=1,156 (0,354 – 3,797). Penggunaan “minyak jelantah” juga ditemukan tidak berkorelasi dengan kejadian hipertensi (p=0,632) dengan PR=1,275 (0,486 – 3,345). Walaupun beberapa penelitian sebelumnya menunjukkan bahwa perilaku merokok dan penggunaan minyak jelantah berkorelasi dengan hipertensi, namun hasil penelitian ini menunjukkan data yang berbeda. Hal ini dapat disebabkan oleh faktor lain. Penelitian selanjutnya perlu mengkaji karakteristik perokok yang mungkin berhubungan dengan kejadian hipertensi.

Kata Kunci: minyak jelantah; merokok; hipertensi; wilayah pesisir; faktor risiko

INTRODUCTION

Hypertension or high blood pressure is a condition in the human body where there is an increase in both systolic and diastolic blood pressure. Hypertension is marked by increased systolic blood pressure of more than 140 mmHg and diastolic blood pressure of more than 90 mmHg (World Health Organization, 2023). Persistent Hypertension can cause damage to the blood vessels, which can lead to kidney failure, problems with the heart (coronary heart disease), brain (stroke) and rupture of blood vessels in the eyes (Prasetyaningrum, 2014). Hypertension is one of the most dangerous health problems in the world. Hypertension, which leads to heart failure and stroke, is also still the leading cause of death in the world (World Health Organization, 2023). Based on data from basic health research in Indonesia, there was an increase in the prevalence of hypertension from 27.8% in 2013 to 34.1% in 2018 (PERHI, 2019).

Based on the cause, hypertension can be divided into two groups, namely primary hypertension (essential hypertension) and secondary hypertension (non-essential). Primary hypertension is also called idiopathic hypertension whose cause is unknown. Primary hypertension is the most common hypertension in society and often associated with unhealthy lifestyles. In contrast to primary hypertension, secondary hypertension is hypertension whose cause is clearly known and is usually related to other diseases, such as kidney disease, hormonal disorders, or the result of using certain drugs (Yanita, 2022).

Study shows that hypertension is often found in coastal areas. The high prevalence of hypertension in coastal areas cause by the high consumption of foods with high salt levels among coastal community, such as sea fish (Harahap et al., 2022; Saputra and Anam, 2016). One of the coastal areas on Lombok Island, West Nusa Tenggara, famous for its tourist areas, is Malimbu. Malimbu is one of the hamlets in Malaka Village, Pemenang District, North Lombok Regency. This area has various tourism potentials. Many people in Malimbu work in the tourism sector, so their health is very important to support the running of the tourism sector.

Based on research conducted by Harahap *et al.* (2022) and Saputra (2016), besides consuming foods with high salt levels, there are several risk factors for hypertension among the coastal community. These factors consist of unmodifiable risk factors and modifiable risk factors. Unmodifiable risk factors including age, gender, and family history of hypertension, meanwhile the modifiable risk factors including poor lifestyle and poor diet (Rachmawati et al., 2023). One of the poor lifestyles that associated with hypertension is smoking (Umbas *et al.*, 2019). Research conducted by Istiana (2021) on teenagers in the coastal area of Mataram shows that the majority of coastal communities, especially teenagers, have smoking behavior (Istiana *et al.*, 2021). Another poor lifestyle habit, such as repeated use of cooking oil more than three times a week, have also been found to increase the risk of hypertension (Agustina and Raharjo, 2015; Tondong, 2012). Used cooking oil is cooking oil that has been used repeatedly (Ardhany and Lamsiyah, 2018). However, other results show smoking behavior

and the use of reused cooking oil do not show a significant correlation with the incidence of hypertension (Fitriyani and Wuni, 2020). However, there is not much data regarding smoking habits and the use of “used cooking oil” associated with hypertension among coastal community.

Smoking behavior is associated with toxic chemicals contained in cigarettes, which can damage the endothelial tissue of arterial blood vessels (Agustina and Raharjo, 2015), while repeated use of used cooking oil is associated with increased cholesterol levels in the blood. Cholesterol is one cause of blockage in blood vessels, which in turn will cause hypertension (Fitriyani and Wuni, 2020).

There has not been much research on the correlation between smoking behavior and the use of used cooking oil with the occurrences of hypertension in the coastal areas of Lombok Island, especially in Malimbu. Therefore, this study aims to identify the correlation between smoking behavior and repeated use of used cooking oil and the incidence of hypertension in Malimbu.

METHOD

This study was an analytical observational study with a cross-sectional design. This research used primary data obtained from interviews and questionnaires distributed by researchers. Filling out questionnaires regarding smoking behavior and repeated use of used cooking oil was carried out by asking questions directly to respondents using a modified questionnaire following the approval from the respondents. The number of respondents in this study was 70 people (n=70). The sampling method used was an accidental sampling method. The researcher selected the most accessible respondents to include in the study.

The data taken in this study were age, gender, family history of hypertension, smoking behavior, the repeated use of cooking oil, as well as the respondent's blood pressure (hypertension and non-hypertension). The data were analyzed univariately to determine the characteristics of respondents (gender, history of hypertension and age). Bivariate analysis, using chi-square was conducted to determine the correlation between smoking behavior and repeated use of cooking oil and the incidence of hypertension. This study used a confidence interval level of 95% and alpha 5%.

RESULTS

The characteristics of the respondents based on gender and family history of hypertension is shown as follows in the table below:

Table 1. Respondents based on gender and family history of hypertension

| No | Characteristics | n | % |
|----|-----------------|----|------|
| | Gender | | |
| 1 | Female | 48 | 68.6 |
| 2 | Male | 22 | 31,4 |
| | Total | 70 | 100 |

| Family history of hypertension | | | |
|--------------------------------|-----|----|-----|
| 1 | Yes | 49 | 70 |
| 2 | No | 21 | 30 |
| Total | | 70 | 100 |

Table 1 showed that the majority of respondents in this study were women (48 people, 68.6%), and the rest (22 people, 31.4%) were men. The majority (49 people, 70%) of respondents in this study did not have a history of hypertension in their family. The remaining 21 people (30%) had a history of hypertension. The age of the respondents was as follows:

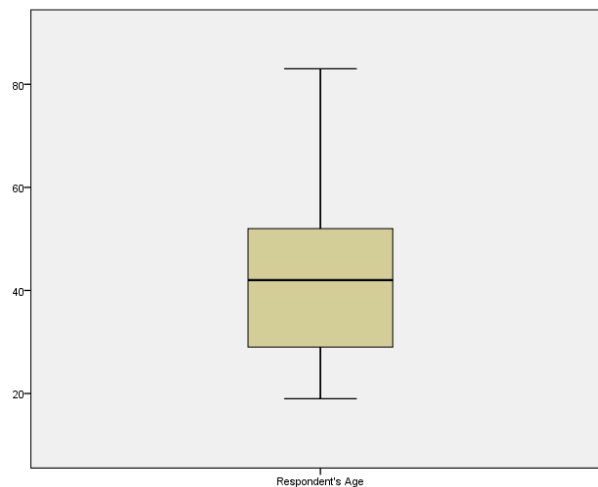


Figure 1. The age of the respondent's

Figure 1. showed that the respondents had an age range of 19 – 83 years, with a mean value of 42.64 years and a standard deviation (SD) of ± 16.01 . The incidence of hypertension in this study was found to be 40% or 28 people from 70 respondents. The chi-square test results can be seen in Table 2 and Table 3.

Table 2. Chi-square test result between smoking behavior and the incidence of hypertension

| Variable | Hypertension | | | | Total | | PR | 95% CI | | p-value |
|-------------|--------------|------|----|------|-------|-----|-------|--------|-------|---------|
| | Yes | | No | | | | | Lower | Upper | |
| | n | % | n | % | n | % | | | | |
| Smoking | 6 | 42,9 | 8 | 57,1 | 14 | 100 | 1,156 | 0,354 | 3,797 | 0,807 |
| Not Smoking | 22 | 39,3 | 34 | 60,7 | 56 | 100 | | | | |

Source: Primary data (2023)

Table 2 showed that the majority of respondents (56 people, 80%) do not smoke, and the remaining 14 people (20%) smoke. Of the 14 people who smoked, six people (42.9%) had hypertension. In this study, the intensity of smoking in this group was not explored. The results of the chi-square test on smoking behavior and the incidence of hypertension showed that there was no significant correlation between smoking behavior and the incidence of hypertension, with a value of $p=0.807$. The prevalence

ratio (PR) for the incidence of hypertension in the smoking and non-smoking groups is 1.156, with a lower bound of 0.354 and an upper bound of 3.797 at a 95% confidence interval (CI).

Table 3. Chi-square test result between the use of “used cooking oil” with the incidence of hypertension

| Variable | Hypertension | | | | Total | | PR | 95% CI | | p-value |
|------------------------|--------------|------|----|------|-------|-----|-------|--------|-------|---------|
| | Yes | | No | | n | % | | Lower | Upper | |
| | n | % | n | % | | | | | | |
| Reused cooking oil | 13 | 43,3 | 17 | 56,7 | 30 | 100 | 1,275 | 0,486 | 3,345 | 0,632 |
| Not reused cooking oil | 15 | 37,5 | 25 | 62,5 | 40 | 100 | | | | |

Source: Primary data (2023)

The majority of respondents in this study did not use used cooking oil (40 people/57.1%), and the remaining 30 people using “used cooking oil”. The frequency of the use of “used cooking oil” was not investigated in this study. Among 30 people who were using “used cooking oil”, 13 people (43.3%) had hypertension, and 17 people (56.7%) did not have hypertension. The chi-square test, showed no significant correlation between the use of “used cooking oil” and the incidence of hypertension, with a p-value = 0.632 and a PR of 1.275, with a lower bound of 0.486 and an upper bound of 3.345, at 95% confidence interval.

DISCUSSION

Smoking is considered unhealthy behavior. Based on research, smoking can cause many dangerous diseases, such as impotence, cancer, stroke, heart attack and maternal and fetal disorders (Sodik, 2018). Several studies have found a correlation between smoking and the incidence of hypertension (Runturambi et al., 2019; Umbas et al., 2019). One of the ingredients in cigarettes that causes hypertension is nicotine. According to Aulia (2010) and Umbas (2019), nicotine can increase adrenaline, subsequently increasing heart rate. An increased heart rate can cause an increase in blood pressure (Aulia, 2010; Umbas et al., 2019).

In this study, the results obtained were inversely proportional to previous research regarding the correlation between smoking behavior and the incidence of hypertension. In this study, it was found that there was no significant correlation between smoking behavior and the incidence of hypertension ($p > 0.05$). This study also found that the majority of respondents, namely 56 people (80%) of the total 70 respondents, did not smoke. We assume that the intensity of smoking among respondents influences the incidence of hypertension in the community. Based on research conducted by Amalia (2022), it was found that smoking intensity was related to the incidence of hypertension in men. In this study, data regarding smoking intensity was not taken, so the respondents' smoking intensity was unknown. This is also a limitation in this research.

Besides smoking behavior, another variable observed in this study was the use of “used cooking oil”. In this study, no correlation was found between using “used cooking oil” and the incidence of hypertension among respondents. Study conducted by Ardhany et al. (2018) shows that, on average, the respondents understand the dangers of using “used cooking oil” for health. However, few know that using “used cooking oil” is dangerous for heart health (Ardhany and Lamsiyah, 2018). In this study, although most respondents did not use “used cooking oil”, almost a portion of respondents still repeatedly use the used cooking oil to process food (42.9%).

The study results showed no correlation between using the “used cooking oil” and the incidence of hypertension in the Malimbu ($p > 0.05$). We assume that the no correlation between the use of used cooking oil and the incidence of hypertension in this study was caused by because the intensity of the use of used cooking oil is still small and not continuous. This study did not explore the correlation between the intensity of the use of "used cooking oil" among Malimbu residents and the incidence of hypertension. Respondents likely use the "used cooking oil" only occasionally, such as when cooking vegetables, fish or other side dishes, not at high intensity. This small intensity of using "used cooking oil" would not much affecting the level of cholesterol and saturated fat content, thereby the risk of hypertension would still low (Fitriyani et al., 2020).

This study results align with study conducted by Alfiyani, (2017) and Fitriyani (2020) that showed no correlation between hypertension due to the use of "used cooking oil". The results of this study were different from previous studies, which stated that the use of "used cooking oil" can cause hypertension due to blocked blood flow that caused by the narrowing of blood vessel plaques from trans fatty acids originating from the use of used cooking oil. In theory, these saturated fatty acids cause metabolic disorders in lipid profiles such as cholesterol, LDL, and HDL, forming plaques in blood vessels and causing atherosclerosis (Fitriyani et al., 2020). Malimbu Hamlet is located in a coastal area with relatively hot temperatures. The relatively hot climate causes vasodilation of blood vessels so relaxation and vasodilation of blood vessels contribute to widening and increasing blood flow, which somehow, helps to dissolve the fat deposits that trigger atherosclerotic plaques (Karim et al., 2018).

CONCLUSION

In this study, it was shown that smoking behavior and the habit of repeatedly used cooking oil did not have a significant correlation with the incidence of hypertension among the respondents. The results of this study can be caused by several factors, including the intensity of smoking and the frequency of using used cooking oil. Smoking intensity and frequency of using used cooking oil were not evaluated in this study, so further study needs to be carried out to confirm these hypotheses.

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