Overview of Fat, Alcohol and Sodium Consumption Habits in Men Aged 25-55 Years in North Tapanuli Regency

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Track Record Article

Accepted: 29 October 2024
Revised: 10 October 2024
Published: 02 November 2024

How to cite :
Habeahan, Y. M., Siagian, A., & Siregar, F. A. (2024). Overview of Fat, Alcohol and Sodium Consumption Habits in Men Aged 25-55 Years in North Tapanuli Regency. *Contagion : Scientific Periodical of Public Health and Coastal Health*, *6*(2), 1129–1138.

Abstract

Hypertension, marked by persistently high blood pressure, is often driven by lifestyle factors like high-fat, sodium, and alcohol consumption. This study investigated hypertension determinants among men aged 25-55 in North Tapanuli Regency. Using a cross-sectional survey design, blood pressure was measured twice with a mercury sphygmomanometer at five-minute intervals by trained medical personnel to ensure accuracy. The sample of 103 participants was determined using the Lemeshow formula to achieve a 95% confidence level. Findings revealed that alcohol consumption significantly impacted hypertension risk (p = 0.03), while high fat and sodium intake showed no significant association with elevated blood pressure in this demographic. Multivariate analysis indicated that alcohol consumption raised hypertension likelihood by 9.091 times, making it a considerable risk factor. To address these results, it is recommended that local health centers (puskesmas) establish Integrated Posts for non-communicable diseases (Posbindu) in accessible areas to enhance community education and preventive healthcare services. These Posbindu can provide valuable resources for blood pressure monitoring, lifestyle counseling, and guidance on dietary modifications to reduce hypertension risk. Family support is also crucial in promoting the regular use of Posbindu services. In addition, the community, particularly individuals in farming professions who constitute a large portion of the population, are encouraged to limit their intake of fat, sodium, and especially alcohol to lower their hypertension risk.This study highlights the need for targeted public health initiatives addressing modifiable risk factors, particularly alcohol consumption, which showed a strong association with hypertension. Such initiatives can significantly reduce cardiovascular risks and enhance health outcomes among men in North Tapanuli Regency.

Keywords : Alcohol consumption, Fat intake, Hypertension, Sodium intake, Alcohol consumption

INTRODUCTION

Non-communicable diseases (NCDs) are the main cause of death globally, based on data from the World Health Organization (WHO) showing that in 2016 out of 57 million deaths that occurred in the world, 41 million deaths (70%) were caused by NCDs. The prevalence of NCDs that have increased, namely high blood pressure in the population over 18 years of age increased from 25.8 percent to 34.1 percent, obesity in the population over 18 years of age increased from 14.8 percent to 21.8 percent. The number of deaths caused by NCDs in Indonesia in 2018 was 1,365,000, 73 percent (Kementrian Kesehatan RI, 2018). One of the highest types of NCDs in North Sumatra Province is hypertension, its prevalence in the population aged 18 years and over reaches 30 percent. The prevalence of high blood pressure in women was 25.6 percent, higher than that of men at 24.1 percent. Prevalence increases with age (Kementrian Kesehatan RI, 2018).

Hypertension can be triggered by unhealthy consumption habits such as consumption of foods containing high fat, drinking coffee, alcohol and smoking can stimulate constriction of blood vessels

so as to increase blood pressure. Based on these data, a preliminary survey and interviews with traditional leaders and local youth of the North Tapanuli community stated that the community has a fairly high meat consumption habit, especially pork and dog meat. The consumption of meat is not only at weddings or death ceremonies, but also used for annual parties or what is called the gotilon party which is held in June or August. Not only pork, but ox meat consumption also contributes, especially at parties for those who are fairly well-off and is used for the traditional event of death, saur matua. Based on the preliminary survey, out of 30 respondents, 12 people (40%) consumed tambul together with alcohol more than three times a week. Meanwhile, 18 other people (60%) admitted to consuming tambul only a few times a month depending on financial conditions and big event activities.

The dominant livelihood in the people of North Tapanuli is farming and working their own fields without hiring other people, so that activities in the fields are considered a substitute for exercise. In connection with the above background, the researcher is interested in conducting research on "the effect of Fat Consumption Habits, Sodium and alcohol consumption in men aged 25-55 years on the incidence of hypertension in North Tapanuli Regency 2023".

METHODS

This type of research is a quantitative analytic survey with a Cross Sectional design. Cross-Sectional research is used to find the relationship of risk factors affecting the occurrence of disease, this study was conducted to analyze the determinants of hypertension based on consumption habits (frequency of fat and sodium intake) and alcohol consumption in North Tapanuli Regency. This study was conducted in the working area of North Tapanuli Regency, North Sumatra Province. The locations in this study were in five community health centers in North Tapanuli Regency that represented the entire population of the community in North Tapanuli Regency because the health centers are located in each area in North Tapanuli, namely Siborongborong Community Health Center, Hutabaginda Community Health Center, Garoga Community Health Center, Pangaribuan Community Health Center, and Siatas Barita Community Health Center. The study was conducted from October 2023 to April 2024. Based on calculations using the Lemeshow formula, the minimum sample size required in this study was 93 with the addition of 10 percent. Thus, 103 samples are needed to achieve a confidence level of 95 percent. Measurement of the incidence of hypertension was obtained through direct measurement using a mercury spygmomanometer twice with a 5-minute measurement interval conducted by medical personnel. The incidence of hypertension can be categorized according to the Ministry of Health (2013), namely not hypertension if blood pressure ≤140/90 and hypertension if blood pressure >140/90. This research using SPSS and has received approval from the Health Research Ethics Commission of the University of North Sumatra.

RESULTS

1. Overview of Respondent Characteristics

Table 1. Distribution of Respondents Based on Age, Gender, education level, occupation

Characteristics Respondents	Frequency (Total = 103)	Percentage (%)
Age		
25-35 Years	39	37,9
36-55 Years	64	62,1
Sex		
Male	103	100
Education Level		
Medium (elementary, middle and high school)	97	94,2
High (D3, S1)	9	5,8
Occupation		
Farmer	97	94,2
Civil Servant / Private	3	2,9
Self-employed	3	2,9

Based on Table 1, information can be obtained that the distribution of respondents aged 25-35 years was 37.9 percent. While respondents aged 36-55 years were 62.1 percent. The distribution of respondents by gender was 100 percent. Respondents with moderate education levels (elementary, junior high and high school) were 94.2 percent while respondents with higher education levels (D3, and S1) were 5.8 percent. Respondents with farmer occupations were 94.2 percent, respondents with civil servant/private sector occupations were 2.9 percent, while respondents with self-employed occupations were 2.9 percent.

2. Univariate Analysis

Table 2. Category Distribution of Respondents Based on Fat and Sodium Intake

Intake	Frequency	%
Fat		
At risk	35	34,0
Not at risk	68	66,0
Sodium		
At risk	79	76,7
Not at risk	24	23,3
Total	103	100,00

Table 2 describes the category of respondents based on fat and sodium intake. Fat functions primarily as an energy substance. When compared with the 2018 Nutrition Adequacy Rate based on each age group, the frequency distribution of respondents according to the level of fat adequacy was 66.0 percent of fat intake was not at risk and as much as 34.0 fat intake was at risk. The distribution of sodium intake of most respondents had sodium intake not at risk 23.3 percent, and sodium intake at risk as much as 76.7 percent.

Table 3. Category Distribution of Respondents Based on Alcohol Consumption

Alcohol Consumption	n	%
Light	9	8,7
Heavy	94	91,3
Total	103	100,0

Table 3 explains that the amount of alcohol consumed by respondents in a day was measured in milliliters. Measured using FFQ semi-quantitative method questionnaire with ordinal scale with criteria Where if light alcohol intake (0.29ml-29ml) and heavy intake (>29ml). Based on the results showed that most respondents consumed heavy alcohol by 91.3 percent. While respondents who consumed light alcohol amounted to 8.7 percent.

Table 4. Distribution of Respondent Categories Based on Hypertension Incidence

Hypertension	n	%
Hypertension	50	49,5
Not Hypertension	51	50,5
Total	103	100,0

Table 4 explains that the incidence of hypertension is categorized into two, namely hypertension and non-hypertension. Based on the results of the study, most respondents experienced hypertension, which amounted to 49.5 percent. While respondents who did not experience hypertension amounted to 50.5 percent.

3. Bivariate Analysis

Tabel 5. Results of Bivariate Analysis Between Fat Intake and Hypertension Incidence

Fat Intake	Incidence of Hypertension						P
	Hypertension		Not hypertension		total		
	n	%	n	%	n	%	
At Risk	18	51,4	17	48,5	35	100	
Not at Risk	33	48,5	35	51,4	68	100	0,837
Sodium Intake							
At Risk	40	50,6	39	49,4	79	100	1,00
Not at Risk	12	50	12	50	24	100	
Alcohol Consumption							
Mild (0.29-29 ml)	1	11,1	8	88,9	9	100	0,03
Heavy (>29 ml)	50	53,2	44	46,8	94	100	

Table 5 above shows the frequency and percentage of the relationship between fat consumption habits and the incidence of hypertension. 51% of respondents' fat intake was at risk of hypertension. The results of the bivariate analysis test using the chi square test showed that there was no significant relationship between fat intake and the incidence of hypertension with a p value = 0.837.

The frequency and percentage of the relationship between sodium intake consumption habits and the incidence of hypertension. In this study, samples whose sodium intake of respondents were at risk of hypertension were 50.6 percent of them had a risk for hypertension. The results of the bivariate analysis test using the chi square test showed that there was no significant relationship between sodium intake and the incidence of hypertension with a p value = 1.00.

The frequency and percentage of the relationship between alcohol consumption habits and the incidence of hypertension. In this study, 53.2 percent of respondents with heavy alcohol consumption were at risk for hypertension. The results of the bivariate analysis test using the chi square test showed that there was a significant relationship between alcohol consumption and the incidence of hypertension with a value of p = 0.03.

4. Multivariate Analysis

Table 8. Multivariate Analysis of Hypertension Incidence

Variable	Exp (B)	Sig	95% C1. For PR	
			Lower	***Upper***
Alcohol Consumption	9,091	0,041	1,093	75,584
Constant	0,014	0,044		

In table 8, the results of simple logistic regression analysis can be obtained, that the variable of alcohol consumption with a value of p = 0.041 which affects the variable is likely to cause hypertension. Then excessive alcohol consumption has a 9.091 times greater chance of causing hypertension in men in North Tapanuli Regency compared to excessive fat and sodium consumption.

DISCUSSION

Hypertension is defined as an increase in systolic blood pressure ≥ 140 mmHg and or diastolic blood pressure ≥ 90 mmHg or if the patient has a history of taking anti-hypertensive drugs. Hypertension is considered mild if the diastolic pressure is between 95-104 mmHg, moderate hypertension if the diastolic pressure is between 105 and 114 mmHg and severe hypertension if the diastolic pressure is 115 mmHg or more. Hypertension is a silent killer where symptoms can vary in each individual and are almost the same as symptoms of other diseases. The symptoms are headache/heaviness in the nape of the neck, vertigo, heart palpitations, lightheadedness, blurred vision, ringing in the ears (tinnitus), and nosebleeds.(Anjayati et al., 2023)

Incidence of Hypertension

Hypertension is a condition of increasing blood pressure in both systolic and diastolic blood pressure vessels (Kementrian Kesehatan RI, 2018). This study found that there were 51 respondents

(49.5%) who experienced hypertension at the age of 25-55 years. This figure is said to be quite high because it almost reaches the prevalence of hypertension in the population aged ≥ 15 years in 2023 in North Tapanuli Regency which is 47.3% (North Tapanuli Regency, 2023). The prevalence of hypertension in this study is higher than the findings of Tirtasari and Kodim with Indonesia Family Life Survey 5 (IFLS 5) data in 13 provinces including Central Java at the age of 18 - 45 years, which is 13.59% and Chuka et al.'s research in Southern Ethiopia at the age of 26 - 64 years at 18.92% (Chuka et al., 2020; Tirtasari & Kodim, 2019). The difference with the findings of previous studies may be due to differences in respondent characteristics and the frequency of blood pressure measurements taken either once or twice.

Relationship between Food Consumption Habits (Fat Intake) and Hypertension Incidence

Food consumption habits are defined as behavior in consuming food in individuals that is carried out repeatedly to meet their needs so that it forms characteristics in each person. According to Adriaansz et al, (2016) food consumption that triggers hypertension is the consumption of foods containing sodium and fat (Adriaansz et al., 2016; Maulidina et al., 2019). The results of the Food Frequency Questionnaire (FFQ) interview showed that respondents with excessive fat intake often consumed saturated fat sources such as pork, fried foods, and coconut milk. Based on the results of the bivariate test, it was found that there was no relationship between fat intake and the incidence of hypertension where the p value = 0.944. From the results of the study it was found that there were 51 respondents (49.5%) who consumed fat affected by hypertension, where respondents who consumed fat were at risk of hypertension as many as 18 respondents and those who consumed fat were not at risk but had hypertension as many as 33 respondents.

In this study showed no significant relationship, because there are other factors that cause increased blood pressure, such as sodium consumption, age, family history, and the presence of other accompanying diseases. This study is in line with research conducted by Kartika (2012) conducted in Kabongan Kidul Village, Rembang Regency showing that there is no relationship between fat consumption and increased blood pressure (Kartikasari et al., 2012). Likewise, research conducted by Sarasaty (2011) in Sawah Baru Village, showed no significant relationship between fat consumption and hypertension as evidenced by a p value = 0.658 (Sarasaty, 2011).

Relationship between Food Consumption Habits (Sodium Intake) and Hypertension Incidence

Sodium is a component commonly consumed in the form of table salt, Mono Sodium Glutamate (MSG), soy sauce, and preserved foods. If the intake increases, the kidneys will respond by increasing the excretion of salt with the urine. If the sodium excretion effort exceeds the threshold of ability, the kidneys will retain water so that the intravascular volume increases. The results of the bivariate test analysis in this study showed that there was no relationship between sodium nutrient intake and the

incidence of hypertension where the p value = 1.000. From the results of the study it was found that there were 51 respondents (49.5%) consuming excess sodium intake affected by hypertension, where of the 51 respondents there were 39 respondents who consumed sodium at risk of developing hypertension and as many as 12 respondents who consumed sodium were not at risk of developing hypertension. The results of the FFQ interview found that high sodium foods that are often consumed by respondents are indomie, dry noodles with a frequency of 1 time / week, salted fish 2 times / week and dapaur salt > 2 tsp / day. Because farmers work from morning to evening in the fields, they cook fish and vegetables that are served quickly so that they don't miss it if they want to go to the fields and farmers also think that eating rice with salted fish is also enough to increase their appetite. Another habit of the respondents is that in a day there are a total of 2-3 tablespoons of salt that they add to their dishes. This study is in line with the results of research by Aprilliyanti (2020) which states that there is no relationship between sodium intake and the incidence of hypertension in the elderly posyandu of Tegowangi Village, Plemahan District, Kediri Regency with a p value of 0.895 (Aprilliyanti & Budiman, 2020). The way to reduce excess salt is to drink plenty of water to remove excess sodium from the body.

Relationship between Alcohol Consumption Habits and Hypertension Incidence

Based on the results of the bivariate test, it was found that there was a relationship between alcohol consumption and the incidence of hypertension where the p value = 0.031. The results of this study are not in line with research conducted by Sukma (2019) which states that there is no relationship between alcohol consumption and the incidence of hypertension (Sukma et al., 2019). From the results of this study, 51 respondents (49.5%) who consumed alcohol experienced hypertension, where as many as 50 respondents who consumed alcohol with severe categories experienced hypertension and as many as 1 respondent who consumed alcohol with mild categories experienced hypertension. In terms of the type of alcohol consumed, all responses consumed tuak, star beer and red wine. The distribution of respondents based on the amount of alcohol consumed is the most >3 glasses per day. the more alcohol consumed will affect the increase in blood pressure. Alcohol has been known since thousands of years, alcohol consumption in normal levels can have a good impact on health otherwise excessive consumption of alcohol will cause addiction and become toxic to the body, if alcohol is mixed with tranquilizers then the toxins contained in the body will be even more.

Effect of Alcohol Consumption on Hypertension Incidence

Alcohol has toxic properties, meaning that if consumed in abnormal or excessive limits it has an impact on human health and the environment. Based on the results of multivariate test analysis using simple logistic regression, the p value = 0.031 shows that there is an effect of alcohol consumption on the incidence of hypertension with an OR of 9.091. Referring to these results, it can be explained

that respondents who consume alcohol have a chance of causing hypertension 9 times. In line with Jayanti's research (2017) which states that there is a significant relationship between alcohol consumption and hypertension patients, from the analysis that has been carried out using the spearman rank test obtained a p-value of 0.0001 ($p < 0.05$) and a PR value of 1.566 (Jayanti et al., 2017).

Alcohol consumption has a significant impact on hypertension, with both acute and chronic effects. Acute ingestion of high doses of alcohol exhibits a biphasic effect on blood pressure (BP), initially decreasing it up to 12 hours post-ingestion, followed by an increase due to vagal inhibition and sympathetic activation (Fuchs & Fuchs, 2021). Chronic consumption, particularly above 30 g/day, is associated with a dose-dependent increase in hypertension risk, mediated by various neurohormonal mechanisms (Naassila et al., 2023; Vacca et al., 2023). This risk is evident even at moderate consumption levels, especially in women and certain ethnic groups like Blacks and Asians, who show a higher susceptibility compared to Caucasians (Fuchs & Fuchs, 2021; Jung et al., 2020). Longitudinal studies confirm a positive dose-response relationship between alcohol intake and hypertension onset, with synergistic effects observed when combined with smoking (Campi et al., 2023; Frost et al., 2023; Gao et al., 2023; Nagao et al., 2021). Excessive alcohol consumption is linked to uncontrolled hypertension, particularly in men, younger adults, and those with a shorter duration of hypertension (Hwang & Choi, 2023). While some studies suggest no significant association between low alcohol consumption and hypertension (Zajc, 2023), others indicate that even low doses can elevate hypertension risk, particularly in Asian men (Jung et al., 2020). Heavy alcohol use is also associated with secondary hypertension causes like insulin resistance and obstructive sleep apnea (Okojie et al., 2020). Furthermore, alcohol consumption interacts with obesity measures, such as BMI and waist circumference, to synergistically increase hypertension risk (Sun et al., 2022).

Consuming excessive alcohol can result in a decrease in health status that can damage and disrupt the function of several organs such as the liver, thus inhibiting heart function and performance. The occurrence of impaired heart function can lead to hypertension (Memah et al., 2019). Alcohol is a product of carbohydrate fermentation by microorganisms under anaerobic conditions (Ondimu et al., 2019). Consumption of alcohol in large quantities and continuously has an impact on increasing cortisol levels in the blood, causing an increase in renninangiotensin aldosterone system (RAAS) activity, which is a hormone system that regulates fluid balance in the body and blood pressure (Kawabe et al., 2019). When a person consumes alcohol, there will be an increase in the volume of red blood cells (erythrocytes) in the body. This will increase blood viscosity which can cause an increase in blood pressure (Okai et al., 2020).

CONCLUSIONS

Based on the research conducted on the influence of fat consumption habits, sodium and alcohol consumption in men aged 25-55 years on the incidence of hypertension in North Tapanuli Regency, it was concluded that: The characteristics of respondents in the incidence of hypertension show that 62.1% are aged 26-55 years, while 37.9% are aged 25-35 years. The majority of respondents, 94.2%, have an education level ranging from elementary to high school, with only 5.8% holding a D3/S1 degree. Most of the respondents work as farmers (97.1%), while only 2.9% are civil servants or private employees. Among the 103 respondents, 49.5% experienced hypertension. There is no significant effect of fat consumption on men aged 25-55 years in North Tapanuli Regency ($p = 0.837$), nor is there any effect of sodium consumption ($p = 1.00$). However, alcohol consumption has a significant influence on hypertension in this group ($p = 0.03$), with alcohol consumption increasing the likelihood of hypertension by 9.091 times compared to other factors.

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