


The effect of giving a heart diet on cholesterol levels and blood pressure in patients at the Malahayati Islamic Hospital in 2023

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Article Info	ABSTRACT
Keywords: Heart Diet, Cholesterol Levels, Blood Pressure	Coronary heart disease is a heart disorder due to a lack of oxygen supply to the heart muscles caused by narrowing or blockages/plaques in the coronary arteries, or coronary artery atherosclerosis. One of the components that make up this plaque is cholesterol crystals. Data from the Malahayati Islamic Hospital, heart disease is the highest rate, a survey was conducted there were patients who did not eat food from the hospital and they ate food from home. Research Purpose: Knowing the Effect of Heart Diet on Cholesterol Levels and Blood Pressure in Patients at Malahayati Hospital This type of research is a quasi-experimental design with one group pre post test. The population in this study were all heart patients who were treated at the Malahayati Islamic Hospital in Medan. Sampling technique was accidental sampling. The sample size was 10 patients. The data were taken using observation sheets for blood pressure and cholesterol, which were analyzed by paired t-test. The results of the study showed that the majority of blood pressure and cholesterol in heart patients before being given a high heart diet and after being normal. 0.38, SD difference = 1.333 and p value = 0.003. The value of $p < 0.05$ means that H_0 is rejected and H_a is accepted, which means that there is a significant difference between the level of cholesterol and blood pressure before and after giving the heart diet to the patient. The conclusion of the study is that there is an effect of giving a heart diet on cholesterol levels and blood pressure in patients at Malahayati Hospital. It is hoped that nurses will inform patients to eat and maintain heart diet foods.
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INTRODUCTION

The heart is a muscular organ in the form of a cone-shaped, hollow muscle with its base above and its peak below (Sutaryo, 2013). We often ignore the importance of heart health for various reasons. Even though we don't know, there are several types of heart disease, but the most feared is coronary heart disease because it can attack people of productive age and can cause heart attacks and sudden death (Sutaryo, 2013).

Heart disease is still the main cause of death in Indonesia. To overcome this, the Indonesian Ministry of Health is strengthening health services at the primary level. Based

on the 2014-2019 Global Burden of Disease and Institute for Health Metrics and Evaluation (IHME), heart disease is the highest cause of death in Indonesia. Basic Health Research (Riskesdas) data for 2013 and 2018 shows an increasing trend in heart disease, namely 0.5% in 2013 to 1.5% in 2018. In fact, heart disease is the biggest cost burden.

Based on BPJS Health data in 2021, the largest health financing will be for heart disease amounting to IDR 7.7 trillion. Director of Prevention and Control of Non-Communicable Diseases, Dr. Eva Susanti, S.Kp, M.Kes said the factors causing the increase in the incidence of cardiovascular disease include hypertension, obesity, smoking, diabetes mellitus, and lack of physical activity. "To overcome the problem of heart disease in Indonesia, the Ministry of Health is strengthening services primary care through population education, primary prevention, secondary prevention, and increasing the capacity and capability of primary services (Kemeskes, 2022).

Cardiovascular diseases such as heart disease, cancer, stroke and kidney failure continue to increase every year and rank as the highest cause of death in Indonesia, especially in the productive ages. Riskesdas data shows the prevalence of cardiovascular diseases such as hypertension increased from 25.8% (2013) to 34.1% (2018), stroke 12.1 per mile (2013) to 10.9 per mile (2018), coronary heart disease remained 1.5% (2013-2018), chronic kidney failure, from 0.2% (2013) to 0.38% (2018). 2018 Riskesdas data also reported that the prevalence of heart disease based on doctor's diagnosis in Indonesia reached 1.5%, with the highest prevalence in North Kalimantan Province 2.2%, DIY 2%, Gorontalo 2%. Apart from these three provinces, there are also 8 other provinces with higher prevalence compared to the national prevalence. The eight provinces are, Aceh (1.6%), West Sumatra (1.6%), DKI Jakarta (1.9%), West Java (1.6%), Central Java (1.6%), Kalimantan East (1.9%), North Sulawesi (1.8%) and Central Sulawesi (1.9%). "If you look at where you live, urban residents suffer more from heart disease with a prevalence of 1.6% compared to rural residents, which is only 1.3% (Ministry of Health, 2021).

Based on 2015 WHO statistical data, hypertension is one of the main triggers for the growing incidence of cardiovascular disease. Hypertension is ranked third as the main cause of death for all ages with a case fatality rate (CFR) of 6.8%. The highest incidence of hypertension is found in developed countries with high incomes and is followed by several cases also found in developing countries. Based on gender, the distribution of people with hypertension in the world who are over 18 years old is 24% men and 20.5% women. In Southeast Asia, the distribution of hypertension sufferers based on gender is 25.3% men and 24.2% women. 4 The prevalence of hypertension in adults in Indonesia reaches 25.8%, the highest is in the Bangka Belitung region, namely 30.9%; South Kalimantan, 30.8%; East Kalimantan, at 29.6%; West Java, 29.4%; and North Sumatra, amounting to 24.7% (Ministry of Health, 2022).

Coronary heart disease is a disruption in heart function due to a lack of oxygen supply to the heart muscles. This condition is caused by narrowing or blockage/plaque in the coronary arteries, otherwise known as coronary artery atherosclerosis. One of the components that make up this plaque is cholesterol crystals. Therefore, one of the risks of atherosclerosis is high blood cholesterol levels (Sianturi and Kurniawaty, 2019)

Blood cholesterol levels can be influenced by intake, as long as the consumption of cholesterol sources is balanced with the body's needs, our body will remain healthy. But if the intake of cholesterol sources is more than required, the blood cholesterol in our body increases. Excess cholesterol in the blood can form deposits in the arteries which cause narrowing and clotting which is called atherosclerosis (Nilawati et al, 2008). Elevated levels of cholesterol, triglycerides, LDL (Low Density Lipoprotein) and VLDL (Very Low Density Lipoprotein), and low levels of HDL (High Density Lipoprotein) are risk factors for heart disease (Andry, 2013).

One of the diseases that is a risk factor for hypertension is high total cholesterol levels. Hypertension is related to total cholesterol lipid abnormalities, where the presence of dyslipidemia increases the risk of developing hypertension so that the risk of cardiovascular morbidity and mortality increases. An increase in CHD (Coronary Heart Disease) and Hypertension occurs epidemiologically when serum total cholesterol exceeds 193.2 mg/dl (Andry, 2013).

Blood pressure is the force (push) of blood against the arteries when blood is pumped out of the heart throughout the body. Peak pressure occurs when the ventricles contract and is called systolic pressure. Meanwhile, diastolic pressure is the lowest pressure that occurs when the heart is at rest (Palmer, 2007). . The blood pressure reference value that is considered the most optimal is <120 mmHg for systolic value and 80 mmHg for diastolic value. Meanwhile, blood pressure values that are considered hypertension are more than 140 mmHg for systolic values and more than 90 mmHg for diastolic values (Corwin, 2009).

A high fiber diet is one solution to reduce the risk of coronary heart disease by reducing blood cholesterol levels. Foods high in fiber, especially water-soluble fiber, are known to reduce cholesterol levels in the blood circulation. Pectin is a fiber that can dissolve in water. Pectin can bind bile acids and inhibit their reabsorption so that cholesterol levels in the blood will gradually decrease.

Based on medical data from the Medan Haji Hospital, the number of heart disease sufferers in 2022 is 199 people, and January-March 2023 is 47 people and observations were made on 3 heart patients who found high blood pressure and cholesterol, the diet was given by the heart diet from the kitchen, the family provided extra food from home.

METHODS

This research uses a Quasi-Experimental research method, which is research by carrying out experimental activities, where this design does not have strict limits on randomization and at the same time the data controls threats to validity. It is called a quasi-experiment because this experiment does not have the characteristics of variables that should be controlled without data or is difficult to carry out. Therefore, the validity of the research is insufficient to be called a true experiment (Notoadmodjo, 2017), namely to see the effect of giving a heart diet on cholesterol levels and blood pressure in patients at the Malahayati Islamic Hospital in 2023

According to Notoadmojo (in Putri, 2020), analysis of research data usually goes through a gradual procedure, namely:

a. Univariate Analysis

Univariate analysis is an analysis carried out on each variable in the research results and describes the characteristics of each research variable. Univariate analysis of this research was to identify the effect of providing a heart diet on cholesterol and blood pressure in the Malahayati Islamic House in Medan in 2023.

b. Bivariate Analysis

Bivariate analysis (hypothesis testing) is a test of two variables that are thought to be related or correlated. This study used bivariate analysis to see the effect of giving a heart diet on cholesterol and blood pressure at the Malahayati Islamic Hospital in Medan in 2023. The statistical test used a paired t-test with significance $\alpha = 0.05$ to determine the effect of giving a heart diet on cholesterol and blood pressure before and after the intervention. If the test results in this research are influential then a probability value or sig < 0.05 is obtained. Statistical test calculations use calculations with a computerized system. The decision on the results of the statistical test 45 is by comparing the probability or sig value with the value (0.05), then the provisions that apply are as follows: 1. If the probability or sig value < 0.05 means H_0 is rejected, meaning there is an effect of giving a heart diet on cholesterol and blood pressure in Malahayati Islamic Hospital. 2. If the probability value or sig > 0.05 means H_0 is accepted, meaning there is no effect of giving a heart diet on cholesterol and blood pressure at the Malahayati Islamic Hospital

RESULTS AND DISCUSSION

Results

Malahayati Islamic Hospital is a private general hospital which operates in the field of medical or public health services, with the aims and objectives being to assist the government and serve the community in the field of improving health levels, both physical, spiritual and social health. This hospital developed into a private hospital under the leadership of the director of RSIM. On April 4 1974 the first stone was laid for the construction of a surgical room which was considered the beginning of its construction, coinciding with the Hijri New Year 1 Muharram 1395 AH (January 14 1975). This was inaugurated by the Governor of North Sumatra, who at that time was the late Alm. Mr. Marah Halim with the name Malahayati Islamic Hospital.

In this study, demographic data on respondents at the Malahayati Islamic Hospital in Medan:

Table 1. Frequency Distribution of Demographic Data at Malahayati Islamic Hospital Medan in 2023

No	Demographic Data	Frequency	Percentage (%)
1	Age		
	30-40 years	2	20.0
	40-50 years	1	10.0
	>50 years	7	70.0

Amount	10	100
2 Gender		
Man	6	60.0
Woman	4	40.0
Amount	10	100

Based on table 1, it can be explained that of the 10 respondents, the majority were > 50 years old, 7 people (70.0), 6 people (60.0%) were male.

Table 2 Frequency Distribution of Blood Pressure Before and After Giving the Heart Diet at the Malahayati Islamic Hospital, Medan

No	Cholesterol And Blood Pressure	Before		After	
		F	%	f	%
1	Normal	2	20	2	20
2	prehypertension	3	30	7	70
3	Hypertension Stage Stage 2 hypertension	5	50	1	10
4		0	0	0	0
	Amount	10	100	10	100

Based on table 2, it shows that before giving the heart diet against cholesterol and blood pressure at the Malahayati Islamic Hospital in Medan the majority were high as many as 5 people (50.0%) and after being given the heart diet the cholesterol and blood pressure levels fell into the normal category as many as 7 people (70.0%) %

Table 3. Frequency Distribution of Cholesterol Before and After Giving the Heart Diet at the Malahayati Islamic Hospital, Medan

No	Cholesterol And Blood Pressure	Before		After	
		F	%	f	%
1	Low	2	20	2	20
2	Normal	3	30	7	70
3	Tall	5	50	1	10
	Amount	10	100	10	100

Based on table 3, it shows that before giving the heart diet against cholesterol at the Malahayati Islamic Hospital in Medan the majority were high as many as 5 people (50.0%) and after being given the heart diet the cholesterol and blood pressure levels fell into the normal category as many as 7 people (70.0%)

Table 4. Effect of Giving a Cardiac Diet on Blood Pressure at the Malahayati Islamic Hospital, Medan

	Mean	Mean Difference	Standard Deviation	Q	Df	P
Pre	1.48					
Post	1.86	0.38	1,333	3.28	19	0.003

The results of the analysis using the paired t-test showed that blood pressure before and after the diet was obtained $t(df) = 3.28(19)$, M difference = 0.38, SD difference = 1.333 and p value = 0.003. The p value is <0.05 , so it can be concluded that H_0 is rejected and H_a is accepted, which means there is a significant difference between blood pressure before and after giving a heart diet at the Malahayati Islamic Hospital, Medan.

Discussion

The research results showed that blood pressure before giving the heart diet was high and after it was prehypertension, blood pressure. Hypertension is high blood pressure which is abnormal and was measured on at least three different occasions. A person is considered to have hypertension if their blood pressure is higher than 140/90 mmHg (Ardiansyah M., 2012), with the cause being that families with hypertension have a higher potential for developing hypertension. Men aged 35-50 years and women who have gone through menopause are at high risk of developing the disease. hypertension. According to Kusuma. H (2016) Diet High salt consumption with high fat content is directly related to the development of hypertension, as well as obesity. Body weight that is 25% more than ideal body weight is often associated with the development of hypertension and lifestyle. Smoking and alcohol consumption. Smoking because of reactions materials or substances contained in both.

According to Jackson's research (2021), based on 10 journals, 100% concluded that a low-salt diet had an effect on reducing blood pressure in hypertensive patients. This was proven by a decrease in blood pressure in hypertensive patients after a low salt diet intervention for 14 days with a significant value of <0.05 . This is in accordance with research by Noor.C (2022) There is a significant influence between a high fiber diet and reduced blood pressure in hypertension sufferers in Welahan Village Rw 01, Welahan District, Jepara Regency.

According to Almatier, (2014) providing a heart disease diet aims to meet adequate nutritional needs according to the heart's capacity, maintain increase and reduce body weight until it reaches the ideal body weight so as not to make the heart work harder and reduce blood pressure. Diet helps eliminate salt or water retention in body tissues provided the diet is sufficient energy, protein, minerals and vitamins. Shape the food according to the disease condition. The amount of sodium is adjusted to the severity of salt or water retention and/or hypertension.

The majority of research results obtained before being given a heart diet had high blood pressure, whereas after the blood pressure decreased due to giving the heart diet by limiting food sources of fat and cholesterol, such as replacing food menus that use eggs with egg whites, using skinless meat, etc. However, in processing some menus still use oil, butter, margarine and coconut milk which are sources of fat. This is in accordance with Safitri's research (2017). The provision of a heart diet at Panembahan Senopati Hospital has limited food sources of fat and cholesterol, such as replacing food menus that use eggs with egg whites, using skinless meat, etc. However, in processing, some menus still use oil, butter, margarine and coconut milk, which are sources of fat and reduce blood pressure.

The general aim of a heart disease diet is to provide sufficient food (not excessive) without burdening the heart, reduce body weight if you are too fat, prevent or eliminate salt or water accumulation. (Almatsier, 20014). Inpatient nutrition services are nutrition services that start from the process of nutritional assessment, nutritional diagnosis, nutritional intervention including planning, food provision, counseling/education, and nutritional counseling, as well as nutritional monitoring and evaluation. The aim is to provide nutritional services to inpatients so that they obtain food intake that suits their health conditions in an effort to speed up the healing process, maintain and improve nutritional status. (PMK No. 78, 2013).

Bad lifestyles such as consuming unhealthy foods such as fast food (junk food), lack of physical activity and exercise for mothers and the elderly have an impact on health conditions. One of these impacts is high cholesterol levels (hypercholesterolemia) in the body, which can trigger various health problems, such as obesity, hypertension, heart problems (coronary heart disease), insulin resistance, type 2 diabetes mellitus and stroke (Ogden et al. , 2010).

Controlling food portions, consuming more vegetables and fruit, limiting consumption of saturated fats, low-fat protein sources and reducing the use of salt will be able to reduce cholesterol levels. The results of research by Roza and Ilham (2015) of 30 respondents turned out to be well informed. 20 people (6, 66%), Enough 5 people (16.67%), Less 23 people (76.67%). From the results of this study, it was concluded that the knowledge of patients at the Arifin Achmad Regional Hospital, Riau Province, regarding the Heart Diet was still lacking.

The results of analysis using the paired t-test showed that the levels of cholesterol and blood pressure before and after giving the heart diet were obtained $t(df) = 3.28(19)$, M difference = 0.38, SD difference= 1.333 and p value = 0.003. The p value is <0.05 , so it can be concluded that H_0 is rejected and H_a is accepted, which means there is a significant difference in the effect of giving a heart diet on cholesterol and blood pressure at the Malahayati Islamic Hospital in Medan.

The provision of the heart diet was adjusted to the condition of the respondents who were still in the transition stage from the acute phase or as a transition from the heart diet I. Apart from that, the majority of respondents had high blood pressure and difficulty chewing so they were given low salt and soft food. Meanwhile, the heart diet III is given in the form of soft or regular food. Heart diet III is given as a transfer from heart diet II or to heart patients with less severe conditions

A total of 6 respondents were men and most of the respondents were in the age group above 50 years. Men's risk of developing heart disease exceeds that of women after adolescence until about age fifty. In this age range, men are 2-3 times more likely to suffer from heart disease than women (Soeharto, 2014)

According to Hasdianah (2014), there are several factors that cause high cholesterol in the blood, namely: Age and gender. Increasing cholesterol to a certain extent is a natural thing that occurs in the aging process. Cholesterol levels increase with age in both men and women. In men, high cholesterol levels are seen between the ages of 45-54 years.

Meanwhile, in women, cholesterol levels are highest at the age of 55-64 years. This is a different trend in the incidence of heart disease between men and women. The incidence of coronary heart disease in women is usually 10 years later than in men. Diet: People most at risk of having high cholesterol levels are people who adopt a diet that contains high levels of saturated fat. Saturated fats (found in meat, butter, cheese and cream) increase LDL cholesterol levels in the blood. Body Weight: Increasing body weight can increase triglyceride levels and reduce HDL (good cholesterol) levels. Lack of physical activity, lack of movement can increase LDL cholesterol levels. Smoking habits, smoking will increase the tendency for blood cells to clot and tend to stick to the lining of blood vessels. This will increase the risk of forming blood clots (thrombus) which cause blockage of the heart (coronary) blood vessels and brain blood vessels.

The result of high LDL cholesterol in the blood causes atherosclerosis. Atherosclerosis causes blood flow in the heart to be disrupted, causing the heart to need force to push blood through the blood vessels experiencing atherosclerosis more strongly, thus causing blood pressure. The higher the cholesterol level in the blood, the higher the risk of atherosclerosis (Corwin, 2019)

In this study, the results obtained were in accordance with the theory stated by Suharti, (2014), Hypertension can occur due to chronic atherosclerosis. Atherosclerosis is a hardening of the arteries characterized by the accumulation of fatty deposits. Atherosclerosis begins with damage to the endothelium cells in the arteries by the presence of excessive free radicals (oxidative stress) which will react with LDL (Low Density Lipoprotein) to form oxidized LDL. The oxidized LDL then migrates with monocyte cells to the subendothelium. Monocytes turn into macrophages and then phagocytize oxidized LDL to form foam cells, resulting in an accumulation of foam cells on the walls of blood vessels, then macrophages cause proliferation of vascular smooth muscle cells and result in the formation of plaque which causes blood vessels to narrow. The arteries where atherosclerosis often occurs are branched or curved arteries, which are typical for coronary arteries, aorta and cerebral arteries. Coronary arteries of the heart that experience atherosclerosis can cause blood flow to be disrupted, causing symptoms of chest pain (angina pectoris), which is a typical symptom of coronary heart disease (Corwin., 2019).

Most systolic blood pressures before being given a heart diet were in the high blood pressure category. After being given a heart diet, the majority of patients' blood pressure decreased. Systolic blood pressure will increase continuously until the age of 70-80 years, while diastolic blood pressure increases until the age of 50-60 years and then tends to persist or decrease slightly (Ramayulis, 2017).

Most patients' blood pressure decreases due to various factors such as medication consumption, sodium intake which is starting to decrease due to restrictions recommended in counseling, and increased intake of potassium, calcium and magnesium. Apart from that, the patient's physical activity also increases slightly, which can help lower blood pressure. Other factors such as stress levels also affect blood pressure. Blood pressure can be very high when stress comes, but this is only temporary. Stress can also trigger someone to behave badly which can increase the risk of hypertension (Sutomo, 2019)

This research is in accordance with research conducted by Makarawung (2016) which stated that on average patients before and after giving a heart diet had an effect on reducing the average systolic blood pressure. However, this research is not in line with research conducted by Dewifianita (2017) which stated that there was a significant difference in systolic and diastolic blood pressure before and after being given a heart diet. This is due to several factors such as medication consumption, stress factors, blood pressure measuring equipment factors, competency factors of blood pressure measuring personnel, as well as the patient's condition at the time the blood pressure measurement is carried out.

The results of statistical tests using the Paired T-test with a 95% confidence level produce a p-value. The T-test with a 95% confidence level produces a p-value of 0.05, namely 0.003. This shows that there is an effect of giving a heart diet on blood pressure. The results of Safitri's research (2017) regarding giving a heart diet, the final average total cholesterol decreased by 9.9 mg/dl but did not show a significant difference. The effect of diet as seen from the intake of energy, carbohydrates, fat and protein did not have a significant effect on changes in total cholesterol levels. This is in accordance with this research that with a given heart diet, blood pressure and cholesterol decrease.

CONCLUSION

Based on research results, the effect of giving a heart diet on cholesterol and blood pressure at the Malahayati Islamic Hospital in Medan is as follows: The cholesterol in respondents at the Malahayati Islamic Hospital in Medan before being given a heart diet was high cholesterol and after giving the heart diet the majority became the norm. Blood Pressure at the Malahayati Islamic Hospital in Medan before being given a heart diet had high blood pressure and after giving the heart diet the majority became normal. The Effect of Providing a Heart Diet on Cholesterol and Blood Pressure at the Malahayati Islamic Hospital in Medan with the results of cholesterol and high blood pressure having a p value of 0.003

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