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THE EFFECT OF GIVING PALOSDEL (OATMEAL AVOCADO PIE AND SOY MILK) ON REDUCING TOTAL CHOLESTEROL LEVELS IN CORONARY HEART DISEASE PATIENTS

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ABSTRACT
In Indonesia, annual fatalities from cardiovascular disease total 651,481, including 331,349 deaths from stroke, 245,343 from coronary heart disease, 50,620 from hypertensive heart disease, and additional cases from other cardiovascular conditions. Objective: The purpose of the study was to analyze the effect of giving PALOSDEL (Avocado Oatmeal Pie and Soy Milk) on Reducing Total Cholesterol Levels in Coronary Heart Disease Patients at the Dagang Kelambir Health Center, Tanjung Morawa District, Deli Serdang Regency. Method: This research is a quasi-experimental study using a pre-test and post-test strategy. Where before and after treatment, cholesterol levels were measured. The sample in this study was 30 people. The analysis was conducted using the t-test with a 95% confidence level using the SPSS version 25 application. Results: The results of the study showed that there was an effect of giving PALOSDEL (Avocado Oatmeal Pie and Soy Milk) on the Decrease in Total Cholesterol Levels in Coronary Heart Disease Patients at the Dagang Kelambir Health Center, Tanjung Morawa District, Deli Serdang Regency with the results of the statistical test value p = 0.000. Conclusions: It can be concluded that PALASDOL has an effect on reducing cholesterol levels in coronary heart disease patients.

Keywords: avocado; cholesterol; decrease; heart; oatmeal

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INTRODUCTION

Heart disease, medically referred to as coronary artery disease, is an illness characterized by the impairment of the primary blood vessels that provide blood to the heart (coronary arteries) (Buja & Schoen, 2022; Gentile et al., 2021). Cholesterol accumulation in blood arteries and inflammation are believed to contribute to this condition (Gusev & Sarapultsev, 2023; Malekmohammad et al., 2021). Coronary heart disease (CHD) arises when the coronary arteries, which provide blood and oxygen to the cardiac muscle, become obstructed by a fatty material known as plaque or atheroma. This plaque progressively accumulates on the inner walls, ultimately constricting the arteries (Dona et al., 2021; Patimang, 2023). The process of narrowing is referred to as atherosclerosis. Atherosclerosis may manifest in youth and intensifies as an individual approaches middle age. When the arteries are completely constricted, the blood flow to the cardiac muscle diminishes. This disease may induce symptoms like angina (chest discomfort). A heart attack transpires when the arteries are constricted, obstructing blood flow to the heart (Ferreir et al., 2023; Gusev & Sarapultsev, 2023; Khan et al., 2020; Nur Fadhilah, 2023).

Excessive cholesterol in the blood can form plaque on the walls of blood vessels, causing a narrowing of the lumen, which is called atherosclerosis. This situation will result in cardiovascular disease(Lesar et al., 2023; Lestari et al., 2020; Shanawaz, 2024). Some of the health problems above are very dangerous, so people try to maintain their health by changing their lifestyle, consuming several herbal food and drink preparations, and minimizing drug consumption. The method is often done by consuming natural ingredients known as back to nature, both herbal food and drinks.(Lestari et al., 2020; Wade, 2023).Riskesdas data indicates a rise in the prevalence of cardiovascular diseases, including hypertension from 25.8% in 2013 to 34.1% in 2018, stroke from 12.1 per thousand in 2013 to 10.9 per thousand in 2018, a stable rate of coronary heart disease at 1.5% from 2013 to 2018, and chronic kidney failure increasing from 0.2% in 2013 to 0.38% in 2018. In Indonesia, annual fatalities from cardiovascular disease total 651,481, including 331,349 from stroke, 245,343 from coronary heart disease, 50,620 from hypertensive heart disease, and other cardiovascular conditions. Excessive cholesterol in the blood can form plaque on the walls of blood vessels, causing a narrowing of the lumen called atherosclerosis. This condition will result in cardiovascular disease.

The method often used is by consuming natural ingredients known as back to nature, both herbal food and drinks. Avocado is a fruit that contains polyunsaturated fat or polyunsaturated fat and monounsaturated fat or monounsaturated fat, which can lower cholesterol (Hasneli et al., 2024; Okobi et al., 2023). Soy milk contains several important nutrients such as protein, calcium, fiber, sodium, vitamin B1, healthy fats, phosphorus, and riboflavin. Thanks to its nutritional content, here are some of the health benefits of soy milk. Amino acids and isoflavones contained in soy milk have the function of lowering cholesterol levels in the blood (Kim et al., 2021; Safitri, 2020; Stephen & Radhakrishnan, 2022).Avocado is a fruit that contains polyunsaturated fat or unsaturated fat—double and monounsaturated fats or monounsaturated fats, which can lower cholesterol. Soy milk contains important nutrients such as protein, calcium, fiber, sodium, vitamin B1, healthy fats, phosphorus, and riboflavin. Thanks to its nutritional content, here are some of the health benefits of soy milk. Amino acids and isoflavones contained in soy milk have the function of lowering cholesterol levels in the blood. Consuming cholesterol-rich foods will protect the body from cardiovascular diseases such as heart disease, stroke, etc(Aisyah, 2020; Effendi, 2022; Sarie et al., 2021).

The extraction of soy milk is derived from soybeans. The protein generated has an amino acid profile almost identical to that of cow's milk, making soy milk an appropriate alternative for cow's milk, particularly for those with allergies to animal protein. Soy milk is an excellent source of potassium, protein, antioxidants, and omega-3 fatty acids. These elements may diminish detrimental cholesterol levels, elevate beneficial cholesterol, and regulate blood pressure, so reducing the risk of heart disease via the consumption of soy milk. The purpose of the study was to analyze the effect of giving PALOSDEL (Avocado Oatmeal Pie and Soy Milk) on Reducing Total Cholesterol Levels in Coronary Heart Disease Patients at the Dagang Kelambir Health Center, Tanjung Morawa District, Deli Serdang Regency.

METHOD

The research was carried out in Dagang Kelambir Village, Tanjung Morawa District, Deli Serdang Regency. This research is a quasi-experimental study using a pre-test-post-test design. This design includes a treatment group, with the first measurement occurring during the pre-test and the subsequent measurement during the post-test. The research population included cardiac patients with elevated cholesterol levels, identified at the Health Center in Dagang Kelambir Village, Tanjung Morawa District, Deli Serdang Regency, with a sample size of 30 individuals. The sample technique used was successive sampling, whereby all participants who fulfilled the selection criteria were included into the research until the

requisite number of subjects was achieved. Data collection Heart patients detected at the health center were made respondents with informed consent. Heart patients were subjected to data collection and cholesterol examination. Heart patients were given PALOSDEL to be consumed daily and monitored by an enumerator for 14 days. On the 14th day, monitoring and evaluation were carried out on the decrease in cholesterol, using a cholesterol test tool, is a device used to monitor cholesterol levels in the blood, was recorded in the observation sheet—data analysis Univariate analysis to determine the frequency distribution of cholesterol levels before and after administration of PALOSDEL. Bivariate analysis is used to determine whether there is an effect before and after the administration of PALOSDEL on reducing cholesterol levels. The statistical test used is the independent t-test, where the assumption of the data is usually distributed. The code of ethics of this research with the number 01.26.820 / KEPK / POLTEKKES KEMENKES MEDAN 2024

RESULT

Respondent characteristics seen from gender and age, the following results were obtained:

Table 1.
Frequency distribution of coronary heart disease sufferers based on gender and age.

Variables	f	%
Gender		
Man	2	6.7
Woman	28	93.3
Age		
32 – 39	1	3.3
40 – 47	1	3.3
48 – 55	12	40
56 – 63	7	23.3
64 – 71	7	23.3
72 – 79	2	6.8
Total	30	100

The data above shows that based on gender, the majority are women, 93.3% (28 people), and the minority are men, 6.7% (2 people). From the table above, the results show that the majority of coronary heart disease sufferers are aged 48-55 years, as many as 12 people (40%), while the minority are aged 32-39 years, as many as one person (3.3%) and aged 40-47 years, as many as one person (3.3%)

Table 2.
Frequency distribution of cholesterol levels in coronary heart patients before and after administration of PALOSDEL

Description	f	%
Before intervention is given		
Cholesterol Levels		
223 – 243	6	20
244 – 260	3	10
261 – 281	7	23.3
282 – 302	6	20
303 – 323	5	16.7
324 – 344	2	6.7
345 – 365	1	3.3
After being given an intervention		
Cholesterol Levels		
159 – 179	15	50
180 – 200	12	40
201 – 221	0	0

222 – 242	1	3.3
243 – 263	1	3.3
264 – 284	1	3.4

Based on the table above, it is obtained that in coronary heart disease patients before PALOSDEL administration, the majority had cholesterol levels of 261 - 281 in as many as seven people (23.3%), while the minority had cholesterol levels of 345 - 365 in as many as one person (3.3%). Based on the table above, it is obtained that in coronary heart disease patients after PALOSDEL administration, the majority had cholesterol levels of 159 - 179 as many as 15 people (50%), while the minority had cholesterol levels of 222 - 242 as many as one person (3.3%), 243 - 263 as many as one person (3.3%) and 264 - 284 as many as one person (3.4%).

Table 3.
Average cholesterol levels in coronary heart disease patients before and after PALOSDEL administration

Intervention	Mean	N	Difference
Before	278.33	30	92.2
After	186.13	30	

Based on the data above, the average cholesterol level of Coronary Heart Disease patients before administering Palosdel was 278.3 mg/dl, and after administering Palosdel, it was 186.13 mg/dl, and the difference in average value was 92.2.

Table 4.
Effect of PALOSDEL Administration on Lowering Cholesterol in Coronary Heart Disease Patients

Variables	Mean	N	Std. Deviation	*Asymp, Sig (2-tailed)*
Pre Test	278.33	30	34,143	0,000
Post Test	186.13	30	25,655	

Based on the table above, the average cholesterol level before PALOSDEL administration was 278.33 mg/dl, with a standard deviation of 34.143 mg/dl. After administering PALOSDEL, the average cholesterol level was 186.13 mg/dl, with a standard deviation of 25.655 mg/dl. The average difference between before and after administering PALOSDEL was 92.2 mg/dl. The statistical test results obtained a p-value = 0.000 ($p < 0.05$), which means there is a significant difference in the decrease in cholesterol levels before and after administering PALOSDEL

DISCUSSION

The study showed that the average cholesterol level before administering PALOSDEL was 278.33 mg/dl, with a standard deviation of 34.143 mg/dl. After administering parasol, the average cholesterol level was 186.13 mg/dl, with a standard deviation of 25.655 mg/dl. The average difference between before and after administering the parasol was 92.2 mg/dl. Interpretation of the results of data analysis using parametric tests using the Paired Sample Statistic Test obtained a p-value = 0.000 ($p < 0.05$), which means there is a significant difference in the decrease in cholesterol levels before and after administering parasol. It can be concluded that parasol affects decreasing cholesterol levels in coronary heart patients.Avocado fruit contains monounsaturated fatty acids, namely monounsaturated fatty acids (MUFA), which help lower LDL cholesterol levels. The decrease in LDL cholesterol levels provides clues about the possible influence of avocado flesh containing omega-9 oleic acid (MUFA) on structural functions, namely on cell membranes as a transduction signal and regulatory functions, namely maintaining membrane moisture to maintain the function of LDL receptors on cell membranes. This can accelerate the cycle of cholesterol uptake, and

then more LDL cholesterol from circulation enters liver cells, and LDL cholesterol in circulation decreases.(Purhadi et al., 2019; Telisa & Cynthia, 2022).

This is due to omega-9 oleic acid in avocados, which can suppress fat deposition in the body. The mechanism of suppressing cholesterol synthesis with the presence of omega-9 oleic acid in avocado flesh is that it can reduce fat absorption and cause blood serum cholesterol to decrease; in other words, omega-9 oleic acid in avocado flesh that is given causes an increase in HDL cholesterol levels and reduces LDL cholesterol levels. Because omega-9 oleic acid protects HDL cholesterol from oxidation, there will be no inhibition of the rate of cholesterol uptake in the tissue. Many studies have proven that MUFA (monounsaturated fatty acids), which are fatty acids that can lower LDL cholesterol levels, do not change the position of HDL even though fat consumption from food is quite high. Thus, the HDL to LDL ratio remains high, reducing the risk of heart disease and stroke.(Purhadi et al., 2022).This is in line with research(Purhadi et al., 2022), which stated that there was a difference in cholesterol levels before and after avocado juice was given. So, avocado juice is effective in lowering cholesterol levels. Avocados contain monounsaturated fatty acids, namely oleic acid, one of the MUFA (monounsaturated fatty acids) groups suitable for lowering LDL cholesterol levels. The decrease in LDL cholesterol levels indicates the possibility of the influence of avocado flesh containing omega-9 oleic acid from the MUFA group on structural functions, namely on the cell membrane as a signaling and regulatory function, namely maintaining membrane moisture to maintain membrane moisture. The effect of LDL receptors on the cell membrane can accelerate the cholesterol absorption cycle so that more LDL cholesterol from the circulation enters the liver cells, and LDL cholesterol decreases in the circulation.

According to the research results(Widia et al., 2023)stated that there is an effect of giving avocado juice (Persea Americana Mill) to older women who have cholesterol in the working area of the Care Health Center of Tanah Bumbu Regency, South Kalimantan Province. Before being given avocado juice intervention, 100% of respondents had severe cholesterol, and after administration, 85% of respondents had normal cholesterol and 15% had high cholesterol.Research results (Achirman & Afrida, 2022) T-test results p value = 0.000, which significantly reduces blood cholesterol levels after being given green apple juice. Green apple juice (Malus Sylvetreis Mill) impacts lowering blood cholesterol levels in sufferers of hypercholesterolemia. Research results (Kasmad et al., 2024) The statistical test used was the paired sample t-test. After conducting research, it was found that the average cholesterol level of respondents before being given avocado juice was 224 mg/dL. After being given avocado juice, cholesterol levels decreased by an average of 209 mg/dL. The paired sample t-test statistical test obtained a p-value of 0.00 < 0.05, meaning that there was an effect of giving avocado butter juice on reducing cholesterol levels in hypercholesterolemia sufferers.

The results of research (Khusuma et al., 2020) show that the average value of cholesterol levels before consuming spinach and avocado juice is 298.77, and the average value of cholesterol levels after consuming juice is 280.09. The results of the bivariate analysis with $\alpha = 0.05$ showed that there was an effect of consumption of avocado and spinach juice on blood cholesterol levels ($p < \alpha$ 0.05). The results of research (Widia et al., 2024) Wilcoxon test showed that there was a difference in the pretest value of cholesterol levels ≥200 mg/dl for 20 elderly people (100%) and the posttest value of 17 people (85%) experienced an increase in cholesterol levels, p-value 0.001 (<0.05). This research concludes that avocado juice effectively and effectively reduces cholesterol levels in the elderly.A study found that 3 grams of soluble fiber in oats (three servings of oatmeal, each 28 grams) can lower total cholesterol and Low-Density Lipoprotein (LDL) cholesterol by about 0.13 mmol/L or 2%, reducing the development of coronary heart disease. A 1% decrease in total cholesterol reduces the risk of

CHD (coronary heart disease) by 2-3%, and a 1% decrease in LDL cholesterol reduces the risk of CHD by 1%. Oats contain over 20 forms of avenanthramides (AVE) and vitamin E. Some elements such as flavonoids, saponins, lignans, and sterols are also found in oats but in small sizes. These elements have antioxidant properties. In addition, avenanthramides contribute to preventing coronary heart disease (CHD) and cancer prevention because they have antioxidant, anti-inflammatory, anticancer, cell proliferation, or inhibition of cancer cell proliferation properties. Vitamin E cells, including tocopherols and tocotrienols, are natural antioxidants that help ward off free radicals and lower cholesterol levels (Imawan, 2023).

Sinulingga said efforts were made to prevent hypercholesterolemia, a condition in which blood fat levels are more than 240 mg/dl, by modifying a lifestyle with a high-fiber diet.(Sinulingga, 2020)This is in line with Dalimunthe's research (2019), which stated that there was a decrease in total cholesterol levels and a significant difference in menopausal women after being given 250 mL/day of soy milk for 3 months. Differences in changes in total cholesterol levels (Δ) between before and after treatment ($p>0.05$). In the research sample, there was a decrease in total cholesterol levels of 15.42 mg/dL(Dalimunthe & Damayanti, 2020). In line with Abdi's research (2019), it was stated that among the three groups of mice, the most significant decrease in cholesterol levels was in the soy milk group compared to the simvastatin group, while in the group given distilled water, there was an increase in total cholesterol levels in mice (Mus musculus).(Pemberian et al., 2019)

CONCLUSIONS

It can be concluded that PALOSDEL has an effect on reducing cholesterol levels in coronary heart disease patients. There is a significant difference in reducing cholesterol levels before and after giving PALOSDEL , as shown by the statistical test value $p = 0.000$

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