THE RELATIONSHIP BETWEEN DIET AND CHOLESTEROL INCIDENCE IN THE WORKING AREA OF THE LAGEUN HEALTH CENTER, SETIA BAKTI SUB-DISTRICT, ACEH JAYA DISTRICT YEAR 2023/2024

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Abstract

One of the current issues is the increasing incidence of non-communicable diseases, influenced by changes in lifestyle, including high cholesterol. Cholesterol is a complex fat compound, with 80% produced endogenously and 20% derived from dietary sources. Foods high in cholesterol typically come from animal products such as egg yolks, meat, liver, and brain. This research employs a quantitative approach with descriptive analysis. The data used in this study are sourced from previous journals. Data collection involved using questionnaires to educate the community in Lhok Buya village about cholesterol, aiming to enhance their knowledge. A total of 35 respondents participated, predominantly female (31 respondents, 88.6%), with male respondents numbering 4 (11.4%). The respondents were categorized into three age groups: Adolescents (12-25 years) with 6 respondents (17.1%), Adults (26-45 years) with 18 respondents (51.4%), and the Elderly (46-65 years) with 11 respondents (31.4%). Following the educational intervention, most respondents (85.7%, or 30 individuals) demonstrated good knowledge about cholesterol, while a minority (14.3%, or 5 individuals) exhibited less understanding.

Keywords: Lifestyle Changes, Knowledge, Cholesterol Disease

1. INTRODUCTION

In Indonesia, the number of people with cholesterol is quite high, reaching 28%. More surprisingly, it turns out that 7.9% of people in the world die from this disease. If dealt with late, high cholesterol will indeed endanger health, and can even cause death. In general, high cholesterol can be defined as a condition when cholesterol levels in the blood are higher than normal values. There are several diseases that can arise due to high cholesterol, such as heart disease, blockage of blood vessels, and stroke. There are no specific symptoms that indicate high cholesterol levels in the blood, but the body will still give signals as indicators that you should be aware of. Non-communicable diseases (NCDs) or degenerative diseases are the leading cause of death globally. World Health Organization (WHO) data shows that of the 57 million deaths that occurred in the world in 2008, 36 million or nearly two-thirds were caused by non-communicable diseases (Wagner & Brath, 2012). NCDs have also caused deaths in younger populations. In low- and middle-income countries, 29% of all deaths in people aged <60 years are caused by NCDs, while in developed countries they account for 13% of deaths. NCDs that are the leading cause of death in people aged <70 years are cardiovascular disease, followed by cancer (27%) (Syarfaini et al., 2020).

According to the World Health Organization, in 2020 the world's population aged 60 years and over (elderly) was more than 1 billion people, representing 13.5% of the world's population of 7.8 billion, a figure 2.5 times greater than in 1980 (392 million),

and projected to reach nearly 2.1 billion by 2050.Elevated cholesterol levels increase the risk of heart disease and stroke. Globally, one-third of ischemic heart disease is caused by high cholesterol. Overall, elevated cholesterol is estimated to cause 2.6 million deaths (4.5% of total) and 29.7 million DALYS, or 2% of total DALYS. Elevated total cholesterol is a major cause of disease burden in both developed and developing countries as a risk factor for ischemic heart disease and stroke. In 2008, the global prevalence of elevated total cholesterol among adults was 39% (37% for men and 40% for women).

Cholesterol is a whitish, waxy fat produced in large quantities by the liver, which is why liver and beef jerky are high in cholesterol (American Heart Association, 2001). The body needs cholesterol to produce hormones and cell membranes. However, excess cholesterol in the blood can cause narrowing of the arteries, leading to heart attacks. Saturated fat is often the main contributor to high cholesterol. Cholesterol produced by the body consists of two types: HDL cholesterol (High-Density Lipoprotein), known as good cholesterol, and LDL cholesterol (Low-Density Lipoprotein), known as bad cholesterol. If bad cholesterol (LDL) accumulates on the walls of the coronary arteries, it can cause blockages (Kowalski, 2010). Extremely high cholesterol levels (Hypercholesterolemia) in the blood are very dangerous and are among the causes of metabolic issues such as heart disease, vascular disease, and other conditions associated with blockages in blood vessels. Atherosclerosis is a condition characterized by blockages caused by fatty deposits forming plaques on the walls of arterial blood vessels. Blockages in the coronary arteries result in coronary heart disease (CHD). Additionally, blockages can occur in the blood vessels of the brain, limbs, kidneys, and various other organs (Syarfaini et al., 2020).

According to data from the Ministry of Health, heart disease in Indonesia is increasing from year to year (Faulata, et al., 2021). Several factors are thought to trigger heart disease including obesity, due to an increase in BMI which causes an increase in the metabolic function of the body which requires a greater supply of oxygen, so that the workload of the heart muscle increases. High cholesterol is also a trigger factor for coronary heart disease because high cholesterol causes blockages in peripheral vessels that reduce blood supply to the heart. High cholesterol can also trigger hypertension and stroke. Another factor that is thought to be related is smoking because smoking can cause vasoconstriction of the heart muscle which can reduce the capacity to transport oxygen throughout the body (Syarfaini et al., 2020).

Cholesterol is needed by the body for the construction of cell membranes and membranes of cell organelles as well as for the formation of steroid hormones synthesized for example by the suprarenal glands and for compiling bile salts, Cholesterol can basically be synthesized by body cells in all organs, but most cholesterol is synthesized by liver cells with an amount of about 500 mg / day (Ganong, 1983). However, cholesterol also comes from the food eaten by the individual and many come from animal cholesterol such as brain, liver, meat, egg yolk and other internal organs (Sofro, 1990). High levels of cholesterol in the blood will cause damage to the blood vessel structure starting from the attachment of fat to the arterial blood vessel wall then continued with the condition of narrowing the lumen of the blood vessels.

The next event is calcium infiltration in the smooth muscle layer of the tunica media of the arteries, this triggers the proliferation of smooth muscle tunica media of the arteries, the more calcium and cholesterol in the wall will reduce the elastic fibers of the blood

vessels. This condition causes changes in the structure of blood vessels with narrow arterial lumen, brittle and inelastic walls called arteriosclerosis, things like this certainly occur gradually but the consequences are very dangerous if efforts are not made from the start to reduce blood cholesterol levels, including by controlling healthy food intake (Yoeantafara & Martini, 2017).

Based on Basic Health Research (Riskesdas) 2018 data, the percentage of people with cholesterol has increased from 2013, namely people with 3 above normal in women rose from 39.6% to 9.9%, while in men from 30.0% to 5.5%, and the most cholesterol sufferers occurred at the age of 55-64 years, namely 12.6%, based on residence in urban areas by 8.3% from rural areas by 6.8%. Based on data from the 2016 Non-Communicable Disease (NCD) profile, the prevalence of hypercholesterolemia in Indonesia occurs in the population group aged more than 15 years, which is 35.9%, and based on residence in urban areas as much as 39.5% while in rural areas 32.1%. For the percentage by age, high cholesterol occurs in most of the age group over 60 years as much as 58.7%. According to provincial data, the percentage of visitors with high cholesterol in Posbindu and First Level Health Facilities (FKTP) in Indonesia for the East Java region with a total cholesterol percentage of 36.1% (Kemenkes RI, 2017).

Prevention needs to be done to control blood cholesterol levels as an effort to avoid the ongoing impact of hypercholesterolemia. prevention can be done by choosing foods that can reduce LDL levels, a diet low in saturated fat and cholesterol, doing regular physical activity, maintaining ideal body weight and making healthier lifestyle changes. Diet and physical activity can determine a person's cholesterol levels. The habit of consuming high-fat foods, and not balanced with sufficient physical activity can cause cholesterol levels in the blood to increase. In Indonesia, the national average proportion of under-consumption behavior of vegetables and fruits is 93.5%, and certain food consumption behavior in the population aged ≥ 10 years consumes the most seasonings (77.3%), followed by sweet foods and drinks (53.1%), and fatty foods (40.7%) (Ministry of Health, 2013). The 2018 Riskesdas results showed that the proportion of physical inactivity increased from 26.1% to 33.5%. Meanwhile, the proportion of fruit and vegetable consumption that is lacking in the population is 95.5%.

According to data from the Ministry of Health, heart disease in Indonesia is increasing from year to year. Several factors are thought to trigger heart disease including obesity, due to an increase in BMI which causes an increase in the metabolic function of the body which requires a greater supply of oxygen, so that the workload of the heart muscle increases. High cholesterol is also a trigger factor for coronary heart disease because high cholesterol causes blockages in peripheral vessels that reduce blood supply to the heart. High cholesterol can also trigger hypertension and stroke. Another factor that is thought to be related is smoking because smoking can cause vasoconstriction of the heart muscle which can reduce the capacity to transport oxygen throughout the body (Yuliantini et al., 2016).

The prevalence of hypercholesterolemia is still high. In the world, the prevalence of hypercholesterolemia cases reaches 45%, in Southeast Asia it reaches 30% and in Indonesia it reaches 35% 7. Indonesian residents who experience hypercholesterolemia are higher in women at 39.6% when compared to men at 30%. One of these factors is hypercholesterolemia, a condition in which blood cholesterol levels are elevated above normal levels. Blood cholesterol levels >200mg/dl increase the risk of heart and blood

vessel disease by 1.8 times greater than blood cholesterol levels <200 mg/dl (Syarfaini et al., 2020).

2. RESEARCH METHODS

This study was a quantitative analytic study, with a cross sectional approach. This study uses variables related to the incidence of events such as physical activity, abstinence from food, and age. The population in this study were all people with cholesterol in the working area of the UPTD lageun health center, setia bakti sub-district, Aceh Jaya district. The number of samples involved in this study using the proportional random sampling formula as many as 35 people. The data used in this study used primary data, namely data directly obtained from the object of research conducted by distributing questionnaires to respondents.   Respondents were asked to answer the questions posed by the author.

3. RESULTS AND DISCUSSION
3.1. Research Results

Table 1. Relationship Between Physical Activity and Cholesterol Levels

Cholesterol * Physical Activity Crosstabulation

			Physical Activity		Total
			Active	Sedentary	
	High	Count	11	8	19
		% within Cholesterol	57.9%	42.1%	100.0%
		% within Physical Activity	45.8%	100.0%	59.4%
		% of Total	34.4%	25.0%	59.4%
Cholesterol	Normal	Count	8	0	8
		% within Cholesterol	100.0%	0.0%	100.0%
		within Physical Activity	33.3%	0.0%	25.0%
		% of Total	25.0%	0.0%	25.0%
	Low	Count	5	0	5
		% within Cholesterol	100.0%	0.0%	100.0%
		% within Physical Activity	20.8%	0.0%	15.6%
		% of Total	15.6%	0.0%	15.6%
Total		Count	24	8	32
		% within Cholesterol	75.0%	25.0%	100.0%
		% within Physical Activity	100.0%	100.0%	100.0%
		% of Total	75.0%	25.0%	100.0%

Based on Table 1, it is known that high physical activity is 11 respondents 45.8% and 8 respondents 33.3% have normal cholesterol levels. For low activity as many as 5

respondents 20.8%. And active physical activity with cholesterol levels as many as 24 respondents 75.0%. 25.0% sedentary physical activity and the total physical activity denn cholesterol levels 100.0%.

Table 2. Relationship Between Abstinence and Food Levels
Cholesterol * Abstinence from Food Crosstabulation

| | | | Abstinence From Food | | Total |
			Yes	No	
Cholesterol	High	Count	8	11	19
		% within Cholesterol	42.1%	57.9%	100.0%
		% within Abstinence from Food	80.0%	50.0%	59.4%
		% of Total	25.0%	34.4%	59.4%
	Normal	Count	2	6	8
		% within Cholesterol	25.0%	75.0%	100.0%
		% within Abstinence from Food	20.0%	27.3%	25.0%
		% of Total	6.3%	18.8%	25.0%
	Low	Count	0	5	5
		% within Cholesterol	0.0%	100.0%	100.0%
		% within Abstinence from Food	0.0%	22.7%	15.6%
		% of Total	0.0%	15.6%	15.6%
Total		Count	10	22	32
		% within Cholesterol	31.3%	68.8%	100.0%
		% within Abstinence from Food	100.0%	100.0%	100.0%
		% of Total	31.3%	68.8%	100.0%

Based on Table 2, it is known that the variable relationship between food abstinence that has cholesterol levels is a high category as many as 8 respondents 80.0% 0 people (0%), normal category 2 respondents (20.0%), and low category 0.0%. And those who did not abstain from food in the high category were 11 (50.0%), the normal category was 6 (27.3%) while the low category was 5 (22.7). The overall total of abstinence from food was 31.3% and no abstinence from food was 68.8%.

Table 3. Age on Cholesterol Levels

Age * Cholesterol Crosstabulation

			Cholesterol			Total
			High	Normal	Low	
Age	32-40	Count	3	3	1	7
		% within Age	42.9%	42.9%	14.3%	100.0%
		% within Cholesterol	15.8%	37.5%	20.0%	21.9%
		% of Total	9.4%	9.4%	3.1%	21.9%
	40-50	Count	16	5	4	25
		% within Age	64.0%	20.0%	16.0%	100.0%
		% within Cholesterol	84.2%	62.5%	80.0%	78.1%
		% of Total	50.0%	15.6%	12.5%	78.1%
Total		Count	19	8	5	32
		% within Age	59.4%	25.0%	15.6%	100.0%
		% within Cholesterol	100.0%	100.0%	100.0%	100.0%
		% of Total	59.4%	25.0%	15.6%	100.0%

Table 3 shows the variable relationship between age and cholesterol levels. From the age of 32-40, the high category was 3 respondents 42.9%, the normal category was 3 respondents (42.9%), and the low category was 1 respondent 14.3%. And at the age of 40-50 16 respondents 64.0% were in the high category, the normal category was 5 respondents (42.9%) while the low category was 4 (16.0%). The total age of 32-40 was 19 respondents (59.4) and the age of 40-50 was 8 respondents (25.0%) and the lowest category was 5 respondents (15.6).

3.2. Discussion

Diet is the regularity of a person in consuming basic food which is calculated based on the number / number of times per day and the suitability of eating time, from an unbalanced diet will be able to affect a person's cholesterol levels, this happens because they do not pay attention to the cholesterol levels of the food consumed.

From the research on dietary patterns, researchers obtained data on respondents based on their adherence to dietary restrictions. Among those who abstained from high-cholesterol foods, 8 respondents (80%) had high cholesterol levels, 2 respondents (20%) had normal levels, and none had low levels. Among those who did not abstain, 11 respondents (50%) had high cholesterol levels, 6 respondents (27.3%) had normal levels, and 5 respondents (22.7%) had low levels. Overall, 31.3% of respondents practiced dietary abstinence, while 68.8% did not. The correct diet involves avoiding high-cholesterol foods, especially fatty foods. Equally important is how one consumes food: eat in moderation, at regular times, and with balanced nutrition.

The study results indicate that for ages 32-40, 3 respondents (42.9%) had high cholesterol, 3 (42.9%) had normal cholesterol, and 1 (14.3%) had low cholesterol. For ages 40-50, 16 respondents (64.0%) had high cholesterol, 5 (20.0%) had normal cholesterol, and 4 (16.0%) had low cholesterol. Overall, 19 respondents (59.4%) were

aged 32-40, 8 (25.0%) were aged 40-50, and 5 (15.6%) were in the lowest category. The results show that higher age is associated with an increased risk of high cholesterol.

4. CONCLUSION

Based on the research data, it can be concluded that following a proper diet, specifically avoiding high-cholesterol foods, particularly fatty foods, is crucial. Equally important to selecting the right type of food for health is understanding how to consume it properly. The results indicated a relationship between age and cholesterol levels across all age groups, with a higher percentage of respondents having elevated cholesterol as age increased. Thus, it can be inferred that the risk of elevated cholesterol levels increases with age.

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