

THE RELATIONSHIP OF DIET TO CHOLESTEROL LEVELS IN THE ELDERLY

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ABSTRAK

Cholesterol is a fat found in the bloodstream or in the cells of the body, which is actually needed for the formation of cell walls and as a raw material for some hormones, but if the cholesterol level in the blood is excessive, it will cause coronary heart disease and stroke. Most of the 80% cholesterol in the body is produced naturally in the liver. Meanwhile, a small portion of about 20% of cholesterol comes from foods consumed, such as products derived from animals, such as meat, eggs, and milk. The aim of this research is to find out how the relationship of dietary patterns and the level of cholesterol in the elderly work area of the Sukaraya Health Center. The research method uses quantitative type with analytic method. This research was conducted at the Sukaraya Health Center. The respondents of this research were 30 persons. This research utilized a cross sectional study to assess the relationship between the variables and this research used a instrument questionnaire. From the chi square statistical test the result shows that diet with cholesterol level has a p value of 0.001 (<005). It shows that there is a significant relationship between the diet and the level of cholesterol in the elderly in the working area of the UPTD Public Health Center Sukaraya. It can be summarized that there is a relationship between diet and cholesterol levels in the elderly in the Sukaraya UPTD Health Center working area.

Keywords: Diet, Cholesterol, Elderly

1. INTRODUCTION

Everyone ages, but healthy aging is the goal of every living being¹. Aging is a continuous and interrelated process that causes a number of changes in the body that affect the functions and capabilities of the entire body. The elderly are synonymous with various health deteriorations, especially physical health, including age-related pathological changes in the cardiovascular system. Common cardiovascular diseases include hypertension, which is influenced by an increase in cholesterol in the blood.

The body needs a balanced metabolism to produce energy from fat, carbohydrates, protein, mineral water and body weight. Therefore, the liver and internal organs contain high levels of cholesterol. Cholesterol is needed by the body for the production of hormones and cell membranes. Too much cholesterol in the blood can lead to narrowing of blood vessels and of course heart attacks. Saturated fat is often the cause of high cholesterol².

Cholesterol is a group of solid fats (lipids) that look like wax. Cholesterol is atherogenic (easy to stick) so that it forms plaque on the

walls of blood vessels. Cholesterol produced by the body consists of two types, namely HDL cholesterol (high-density lipoprotein) known as good cholesterol, and LDL cholesterol (low-density lipoprotein) known as bad cholesterol (LDL) which accumulates in the walls of the coronary arteries causing blockages³.

According to researchers Suarsih, (2020) stated that there is a relationship between diet and the incidence of hypercholesterolemia¹, and according to Lasanuddin dkk., (2022) suggests that a relationship between diet and the incidence of cholesterol in the elderly exists⁴.

The world population aged 60 years and older will reach more than 1 billion by 2020, which is 13.5% of the world's population of 7.8 billion, a figure that is 2.5 times greater than in 1980 (392 million) and is estimated to rise to nearly 2.1 billion by 2050. Elevated cholesterol levels increase the risk of heart disease and stroke. Globally, one-third of coronary heart disease caused by cholesterol is estimated to cause 2.6 million deaths (4.5% of the total) and 29.7 million or 2% of all deaths.

According to the Badan Pusat Statistik, the number of elderly people in Indonesia reaches 26.82 million. Based on the March 2020 Susenas data, there are six provinces that have reached the stage of the elderly population structure, namely the proportion of the elderly population is more than 10%. In Indonesia, the prevalence of hypercholesterolemia is 1.5% in men and 2.2% in women⁵. Based on the results of Riskesdas in 2013, there are Indonesian women who have cholesterol levels higher than normal at 39.6%, compared to men at 30%. South Sumatra Province, especially Palembang, is one of the regions in Indonesia that has high cholesterol levels compared to other regions⁶.

According to the South Sumatra District Health Office, the number of people with cholesterol in 2019 was 35,902 cases. According to the Ogan Komering Ulu District Health Office (2019), people with high cholesterol rank third out of the top ten diseases with the number of cases in 2019 totaling 1,564 cases⁷. Data on cholesterol patient visits at UPTD Puskesmas Sukaraya in January-June 2023 were 141 people⁸. Based on the description of the data above, the researcher is interested in examining the relationship between diet and cholesterol levels in the elderly in the Sukaraya Health Center working area.

2. METHOD

This research design uses descriptive quantitative with a cross-sectional approach. The sample in this study were 30 elderly people with cholesterol in the work area of UPTD Puskesmas Sukaraya. The sample in this study used accidental sampling.

The inclusion criteria in this study were men/women aged 50 years and over. Patients who come to the Sukaraya Health Center when researchers conduct research, and are willing to become respondents. Exclusion criteria are men/women aged 50 years and under and not willing to be respondents. The research time was October 2023. This research analysis uses Univariate and Bivariate Analysis.

3. RESULTS

Table 1. Frequency Distribution of Respondents' Age in the Sukaraya Health Center UPTD Work Area

Criteria	Frequency	Percentage
50-55 years	11	36,7%
56-60 years	19	63,3%
Total	30	100%

The table above shows that the respondents who became the largest sample were aged 56-60 years, there were 19 respondents (63.3%).

Table 2. Characteristics of Respondents Based on Diet in the UPTD Sukaraya Health Center Working Area

Diet	Frequency	Percentage
Regular	6	20,0%
Irregular	24	80,0%
Total	30	100%

The table above shows that the diet in the work area of UPTD Puskesmas Sukaraya is mostly irregular as many as 24 respondents (80.0%).

Table 3. Characteristics of Respondents Based on Cholesterol Levels in the UPTD Sukaraya Health Center Working Area

Cholesterol Levels	Frequency	Percentage
High	26	86,7%
Low	4	13,3%
Total	30	100%

The table above shows cholesterol levels in the UPTD Sukaraya Health Center working area with high cholesterol levels as many as 26 respondents (86.7%).

Table 4. Relationship between Diet and Cholesterol Level

Diet	Cholesterol Levels	Total	P
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			Value
	High	Low	
Regular	2	4	6
Irregular	24	0	24
Total	26	4	30

From the results of the analysis of the table above, it can be seen that of the 30 respondents, a regular diet was obtained with a category of high cholesterol levels of 2, low cholesterol levels of 4. And an irregular diet with a category of high cholesterol levels of 24, low cholesterol levels of 0. Based on the results of the analysis using the Chi Square statistical test, a p value of 0.001 was obtained, which means that there is a relationship between diet and cholesterol incidence.

Fat is a nutrient needed by the body, both essential and irreplaceable, all contained in organic solvents but not easily soluble in water. There are several main sources of dietary fat, namely invisible fat, which is fat that occurs naturally in food. Other food sources of protein energy are meat, eggs, grains and nuts, invisible fats are fats that can be seen by the eye such as cooking oil, bacon or other animal waste, margarine and added fats, commercial fats added to foods such as: pies, ice cream, cakes and french fries⁹. In the selection of food and the timing of human meals, one of them is influenced by age. At the Sukarya Community Health Center, the largest number of respondents were aged 56-60 years as many as 19 respondents (63.3%), and aged 50-56 years as many as 11 respondents (36.7%).

Nutrition is very useful for maintaining health and preventing disease. The problem of nutritional disorders is not only a lack of nutrients but can also be an excess of nutrients or an unbalanced diet. Even today there are many incidents of disease caused by an unbalanced diet. Where most in the working area of UPTD Puskesmas Sukaraya are less healthy because lately many people prefer to consume instant food without paying attention to the nutritional balance of the food consumed.

Cholesterol is a white waxy substance that forms naturally in our body. Cholesterol is a type of fat and is a nutrient that the body needs as a source of energy in addition to other nutrients such as carbohydrates, proteins, vitamins, and minerals. Fat is a source of energy that the body needs and produces the most calories. Apart from being a source of energy, fat also plays an important role in the formation of cell walls in the human body. Cholesterol is found in many foods that we consume. Cholesterol is also produced by all body cells. But the most important one is liver cells. Some types of cholesterol are important for the health of the body. Cholesterol not only serves as a building block for cell walls, but is also a basic requirement for the secretion of certain hormones. In general, the human liver produces 70-75% of cholesterol in the blood. Meanwhile, the remaining 25-30% requirement is met by the food we consume every day. Cholesterol consumed in a balanced dose brings good benefits to the body, but excessive consumption can lead to various diseases¹⁰.

Based on the results of research conducted in the work area of UPTD Puskesmas Sukaraya, it shows that out of 30 respondents with a regular diet as many as 6 people (20.0%), and irregular as many as 24 people (80.0%). While respondents with cholesterol levels in the high cholesterol level category were 26 people (86.7%), and low cholesterol levels were 4 people (13.3%). Statistical tests using a computer with the SPSS program, namely the Chi-Square test, showed that there was a relationship between diet and cholesterol levels, with a p value = $0.001 < \alpha = 0.05$. Based on the results of statistical analysis, it is known that there is a relationship between diet and cholesterol levels. The results of research similar to this study state that there is a relationship between diet and cholesterol incidence with the results of a p value = 0.000 conducted in the Tambaksari Health Center Working Area¹.

Balanced food sources are needed by the body to maintain a balanced metabolism in producing energy, the energy sources needed are

energy sources derived from fats, carbohydrates, proteins, water, minerals, the body requires a number of calories according to one's body weight. Excessive consumption of one of the fat subers will result in excess cholesterol because all excessive energy sources will be stored in the form of cholesterol¹¹.

Elevated blood cholesterol levels can be caused by factors that can affect plasma cholesterol concentrations, namely the amount of cholesterol ingested daily, a diet of highly saturated fats and decreased insulin and thyroid hormone levels. A history of high blood pressure, smoking, obesity, lack of exercise, poor water drinking habits, coffee drinking habits, and age are risk factors for increasing total blood cholesterol levels¹².

Previous research stated that 3 respondents (20%) who were classified as hypercholesterolemia had a good diet. This is indicated by most respondents not consuming foods high in fat and cholesterol, so the factor that is thought to be the cause of hypercholesterolemia is age, because it is known that 3 respondents have an age range of 51-60 years. While in the hypercholesterolemia group who had a bad diet as many as 12 respondents (80%), it was shown by most respondents often consuming foods high in fat and cholesterol which are risk factors for hypercholesterolemia¹³. Some studies state that the risk of increasing total cholesterol levels is at the age of over 45 years and in this study the age range of respondents was 60-90 years. The age factor affects the deterioration of body functions including blood vessel stiffness (shrinking and aging). Increasing age also affects the decline in the function of estrogen and testosterone hormones in distributing fat, thus allowing fat accumulation in the body which is supported by changes in diet that were previously high in carbohydrates, high in fiber and low in fat changing to a new diet that is low in carbohydrates, low in fiber, and high in fat, thus shifting the quality of food towards an unbalanced diet¹⁴.

High levels of cholesterol in the blood is one of the triggers for heart disease, stroke, and

diabetes mellitus. Based on research that has been done, the risk of atherosclerosis, which is the cause of non-communicable diseases (heart disease, stroke, and diabetes), will be high if the cholesterol level in the blood exceeds the normal limit¹⁵.

Vegetable and fruit consumption behavior is an activity or activity of individuals to meet the needs of vegetables and fruits in order to remain nutritionally adequate¹⁶. Fiber intake indirectly affects blood cholesterol levels by consuming 25-30 g of water-soluble fiber per day to reduce blood cholesterol levels. Water soluble fiber can be obtained through beans, apples, pears, carrots, broccoli, cucumbers, and oats^{33,34}. Regular consumption of fiber, especially water-soluble fiber, can reduce cholesterol levels through the mechanism of binding bile salts and removing them through feces. Increased bile salt excretion can reduce blood cholesterol levels by increasing the absorption of blood cholesterol into the liver¹⁷. Another study mentioned that lactobacillus can ferment fiber into short-chain fatty acids and gas, short-chain fatty acids can bind bile acids so that bile acid levels decrease. Reduced bile acid can slow the absorption of fat so that fiber plays a role in lowering cholesterol levels in the blood¹⁸.

Increased cholesterol levels can be controlled by conducting health screening, namely checking blood cholesterol levels and education that can be done regularly so that blood cholesterol levels can be controlled so as to minimize the incidence of systemic diseases (Coronary Heart Disease) in Indonesia¹⁹. No matter how good the treatment and medical personnel (doctors, nurses, nutritionists and others) are in supervising and monitoring, if the patient concerned does not have the awareness to reduce their cholesterol levels by implementing a healthy diet and lifestyle, it is certain that treatment tends to fail. This requires the cooperation of various parties, especially the goodwill of the patient to be able to obtain the planned results²⁰.

4. CONCLUSIONS

Based on the data from the results of the research that has been carried out, it can be concluded that the frequency distribution of age in the elderly there are age criteria 50-55 years there are 11 respondents (36.7%), and age criteria 56-60 years there are 19 respondents (63.3%). The frequency distribution of respondent diet data mostly included irregularly, namely 24 people (80.0%), and regularly, namely 6 people (20.0%). The frequency distribution of respondents' cholesterol level data mostly included high cholesterol levels, namely 26 people (86.7%), and low cholesterol levels were only 4 people (13.3%). In the elderly in the Sukaraya Health Center Working Area and there is a relationship between diet and cholesterol levels in the elderly, with a p value of 0.001.

It is expected to increase public awareness to be able to know about understanding cholesterol levels in the Sukaraya Health Center Working Area and is expected to improve the quality and education that is different and more in-depth and clearly detailed to facilitate further research.

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