

THE EFFECT OF EXCESSIVE SALTED FISH CONSUMPTION ON BLOOD CHOLESTEROL LEVELS IN GUNUNG MALANG VILLAGE

ABSTRACT

Salted fish is fish that has been preserved through a process of salting and drying. Typically, the fish is cleaned first, then evenly coated with salt, and then dried in the sun until its moisture content is reduced. Salted fish contains high levels of sodium (salt). Excessive consumption of salt can lead to high blood pressure, and prolonged high blood pressure can worsen heart and blood vessel conditions, which are closely linked to increased levels of LDL (bad) cholesterol. This study was conducted to identify cholesterol levels in the blood of individuals who consume salted fish in excess. Using 30 respondents, cholesterol levels in the blood were measured using a POCT device. Among them, 15 respondents who frequently consumed salted fish had an average maximum cholesterol level of 411.13 mg/dL, while the 15 respondents who did not frequently consume salted fish had an average maximum cholesterol level of 213.8 mg/dL. This study indicates that salted fish and dietary patterns are associated with increased blood cholesterol levels, significantly depending on how frequently salted fish is consumed, the type of salted fish consumed, and the level of cholesterol intake from other foods. However, further testing and research are needed to identify cholesterol levels in individuals who consume excessive amounts of salted fish.

Keywords: salted fish, blood cholesterol, blood vessels

INTRODUCTION

Salted fish is fish preserved through a process of salting and drying. Typically, the fish is first cleaned, then sprinkled with salt evenly, and then dried in the sun until the water content reduces. This process aims to prevent the growth of microorganisms that cause spoilage.^{(1),(2)} The health benefits of salted fish include preventing anemia, maintaining healthy bones and teeth, and aiding bone healing. Salted fish also contains protein, vitamins A, B1, and C, and is a source of animal protein.⁽³⁾ However, behind the many benefits of salted fish, it also has side effects if consumed too often in large quantities, including causing high blood pressure (hypertension), swelling (edema), and the risk of stroke and heart disease.⁽⁴⁾

Besides its benefits, salted fish contains high levels of sodium (salt). Excessive consumption of too much salt can trigger high blood pressure. Prolonged high blood pressure can worsen heart and blood vessel conditions, which are closely linked to elevated LDL (bad) cholesterol levels.⁽⁵⁾

Cholesterol is a fatty compound produced by the body and found in the blood. Cholesterol plays a vital role in the formation of cells, hormones, and vitamin D. Normal blood cholesterol levels are less than 200 mg/dL. High cholesterol levels can lead to several serious health problems, including heart disease and stroke.⁽⁶⁾ High or excessive cholesterol levels in the blood will easily stick to the inner walls of blood vessels, excess LDL through the oxidation process will form a clot and if the clot gets bigger it will cause narrowing of the blood vessels so that it will burden the heart's performance in pumping blood.⁽⁷⁾ If the plaque ruptures, a blood clot (thrombus) can form which completely blocks blood flow. This condition can cause a heart attack if it occurs in the coronary artery or a stroke if it is in the brain vessels.^{(8),(9),(10)}

People in the Gunung Malang area consume salted fish as a side dish. Salted fish is chosen because it's affordable and popular, making it a staple food with rice. However, the

people of Gunung Malang are still unaware of the potential health effects of excessive salted fish consumption, particularly on blood pressure and LDL cholesterol.⁽¹¹⁾

METHOD

This research was conducted from February to April 2025, using a quantitative method, by checking samples using a POCT tool taken from a total of 30 respondents. The sample taken for testing on the POCT tool refers to the amount of cholesterol levels that appear on the checking tool by taking capillary blood as a sample.⁽¹²⁾The tools used to check blood cholesterol levels include lancets, needles, handheld scanners, POCT devices, and cholesterol strips. The materials used are alcohol swabs and capillary blood samples.

RESULTS

The difference between those who consume salted fish and those who do not consume salted fish

From research conducted on 30 samples, including 15 samples that consumed and 15 samples that did not consume excessive amounts of salted fish, the following results were obtained:

Table 1. Cholesterol levels of those who like and dislike salted fish.

Cholesterol Levels		
No	THOSE WHO LIKE SALTED FISH	THOSE WHO DON'T LIKE SALTED FISH
1	493	184
2	495	217
3	417	255
4	505	236
5	552	183
6	508	224
7	390	176
8	562	193
9	498	243
10	578	359
11	214	207
12	208	191
13	253	170
14	233	164
15	261	205
Average	411.13	213.8

To see the distribution data of cholesterol levels of respondents who do not like salted fish can be seen from the following table:

Table 2. Distribution of respondents who do not like salted fish in Gunung Malang Village.

Not a fan of salted fish in Gunung Malang Village

Cholesterol Level Range	Number of Respondents	Amount of consumption (In 1 week)
160 – 180 mg/dL	3 people	0 times
181 – 200 mg/dL	4 people	2 times
201 – 300 mg/dL	7 people	2 times
301 – 400 mg/dL	1 person	4 times
Amount	15 people	

The results of the study of 15 respondents who do not like salted fish, respondents who have a range of 160-180 mg / dL as many as 3 people where respondents do not consume salted fish at all because respondents do not like salted fish as a side dish with rice. Meanwhile, those who have examination results with a value of 182-200 mg / dL there are 4 people on average among them consume salted fish but in small quantities and they prefer to consume vegetables as a side dish with rice. There are also respondents who have a range of 201-300 mg / dL as many as 7 people where some respondents still consume salted fish but within a period of consumption of 1 month at most 2-3 times. Meanwhile, respondents who have a value of 301-400 mg / dL amounted to 1 person, the respondent admitted that they still often consume salted fish with a consumption period of 1 week 3-4 times.

Below you can see the distribution table of the amount of cholesterol in respondents who like salted fish:

Table 3. Distribution of respondents who like salted fish in Gunung Malang Village.

Salted Fish Fans in Gunung Malang Village		
Cholesterol Level Range	Number of Respondents	Amount of consumption (In 1 week)
200 - 300 mg/dL	5 people	6 times
301 – 400 mg/dL	1 person	6 times
401 - 500 mg/dL	4 people	7 times
501 - 600 mg/dL	5 people	7 times
Amount	15 people	

Based on the results shown in the table above, the study of 15 respondents who consumed salted fish showed that their levels were higher than the normal value, at >200

mg/dL. The average respondent consumed salted fish in excessive amounts. Respondents explained that they consumed salted fish 6-7 times a week..

From the data in the cholesterol distribution table for those who like and dislike salted fish, a statistical test was carried out as follows:

Group	Statistics	Df	p-value	Interpretation
Love Salted Fish	0.871	15	0.035	Abnormal (p < 0.05)
Don't Like Salted Fish	0.805	15	0.004	Abnormal (p < 0.05)

Normality Test (Shapiro-Wilk)

From the normality test, the data between those who liked and disliked salted fish were not normally distributed, because the p-value in each group was <0.05. Therefore, the analysis was continued using the non-parametric Mann-Whitney U Test.

Mann-Whitney U test

Statistical Test	Mark
U Statistics	205.0
p-value	0.0001

The interpretation results of the Mann-Whitney U test have a p value of 0.0001 < 0.05, meaning that there is a significant difference between the groups that like and dislike salted fish in terms of the observed values.

DISCUSSION

The results of the normality test indicated a correlation between salted fish consumption and blood cholesterol levels. Statistical testing also demonstrated a significant difference between those who liked salted fish and those who disliked it. This could be due to respondents' consumption of other foods high in cholesterol, in addition to salted fish.

Consuming salted fish more than Within normal limits, normal HDL cholesterol levels in the body will decrease while normal LDL cholesterol levels will increase. This can trigger symptoms of hypercholesterolemia, ultimately leading to diseases caused by high cholesterol. This is because salted fish contains excessive salt, and excessive consumption carries several risks, including increased risk of heavy metals, high blood pressure, cancer, and heart disease.

High cholesterol intake can have an effect on the lipid profile, because it plays a direct role in the digestive system in lowering cholesterol.⁽¹³⁾ If overproduction occurs, it can be deposited on blood vessel walls, potentially obstructing blood flow. A 100 mg/day increase in fat consumption can increase cholesterol by 2-3 mg/dL. This can affect cholesterol biosynthesis, thus increasing blood cholesterol levels.⁽¹⁴⁾

Table 1 shows the results of a study conducted through capillary blood tests using a POCT device. From 30 respondents, 15 of whom liked salted fish, the average maximum blood cholesterol level was 411.13 mg/dL, while in the 15 respondents who did not like

salted fish, it was 213.8 mg/dL. This can be interpreted that the consumption of salted fish has an effect on increasing blood cholesterol levels. In addition, the results of this study indicate that each respondent has different cholesterol levels depending on the types of other foods they consume besides salted fish.

The research results also found a correlation between respondents who While some people may or may not like salted fish in excess, excessive consumption can increase LDL levels in the blood and clog blood vessels, leading to disease. These results align with a study by Ardytama Kusuma Yudha, which found a significant correlation between diet and blood cholesterol levels.⁽¹⁵⁾

CONCLUSION

This study shows that salted fish and dietary patterns are related to increased blood cholesterol levels, significantly depending on how often salted fish is consumed, the type of salted fish consumed, and the level of cholesterol-containing foods consumed. However, further testing and research, such as experimental studies on cholesterol levels in salted fish, are needed, and the results of the research data should be analyzed descriptively and quantitatively to identify the correlation between cholesterol content in salted fish and blood cholesterol levels.

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