The Effect Of Giving *Luffa Acutangula* Juice
On Reducing Cholesterol Levels In The Elderly
In Jatiimakmur Village, Pondok Gede Sub-District, Bekasi City, 2022

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Abstract. Cholesterol is a soft fatty compound like wax (wax). Most of the body's cholesterol needs are produced by the liver, while hypercholesterolemia (hyper: high, -emia: blood) is a disorder of the fat content in the blood. The prevalence of heart disease in West Java Province based on a doctor's diagnosis is caused by hypercholesterolemia in the population according to characteristics aged 55-64 years by 3.9%, namely as many as 83,251 people. Objective: Is to determine the effect of giving *luffa acutangula* juice on cholesterol levels in the elderly in Jatimakmur Village, Pondok Ge District, Bekasi City in 2022. Methods: Type of quantitative analytical research, one group pretest posttest design. The study population was all elderly aged > 60 years in Jatimakmur Village, Pondok Gede sub-district, Bekasi City and a sample of 27 people. Univariate, bivariate data analysis. Results: The results of the analysis of the various means showed that the condition of cholesterol levels in elderly respondents who received *luffa acutangula* juice/oyong therapy decreased by106,370 with a p value < 0.05, namely 0.00. Based on the above data that at 95% there is an effect of giving *luffa acutangula* juice on reducing cholesterol levels in the elderly. Suggestion: It is hoped that health workers will be able to provide information to patients who have high cholesterol levels (hypercholesterolemia) that they can consume *luffa acutangula* juice/oyong at the right dosage and the right way to reduce high cholesterol levels (hypercholesterolemia) in the elderly.

Keywords: Hypercholesterolemia, *luffa acutangula*, elderly, age

A. PRELIMINARY

The global prevalence of hypercholesterolemia is around 5%, around 30% in Southeast Asia, and 35% in Indonesia. Currently, hypercholesterolemia is still a health problem. Excess cholesterol levels are estimated to cause 2.6 million deaths and 29.7 million injuries each year. Hypercholesterolemia is a risk factor for various diseases. High cholesterol has been shown to be associated with an increased risk of coronary heart disease, stroke, hypertension and obesity. Hypercholesterolemia does not cause specific symptoms. Hypercholesterolemia can only be detected by a blood test. If the cholesterol level is > 200 mg/dL, it is said to suffer from hypercholesterolemia (Balitbangkes, 2013;

2018; WHO, 2019). According to the 2018 Riskesdes, hypercholesterolemia in Indonesia is around 7.6% and hypercholesterolemia is common.

According to the World Health Organization (WHO), an elderly person is someone who has reached the age of 60 years and over. Elderly is the age group of people who have reached the final stage of their life. Meanwhile, the number of elderly people in Indonesia alone is estimated to reach 80,000,000 in 2020. According to data from the Ministry of Health for 2020, namely pre-elderly (ages 5-59), elderly (ages 60-). 69) and the elderly at risk (elderly > 70 years or age > = 60 years with health problems).

Cholesterol is a soft fatty compound like wax (wax). Most of the body's cholesterol needs are produced in the liver, but more cholesterol can also be obtained from foods such as egg yolks, meat, chicken, shellfish and milk. Dietary cholesterol is the result of the breakdown of fats, resulting in the formation of triglycerides and free fatty acids. All these fatty compounds are absorbed into the body through the intestines into the blood. Hypercholesterolemia (hyper: high, -emia: blood) is a disorder of fat levels in the blood. Abnormal fat levels are not a disease, but a risk factor for other diseases, especially cardiovascular disease, which is characterized by increased fasting cholesterol. In addition, hypercholesterolemia is also directly responsible for the development of atherosclerosis (Ruslianti, 2014).

In the elderly, the size of the liver and pancreas decreases, which causes a decrease in blood flow to the liver, which causes changes in the proportion of fat without changing bile acid metabolism, which causes an increase in cholesterol. excretion compared to normal. Accumulation of atherosclerosis due to adult cholesterol in the elderly occurs during childhood and adolescence, which then accumulates in the lining of the arteries, increases to atheroma at the age of 55 years and over, and plaque rupture causes cardiovascular disease (Miller, 2012).

Blood cholesterol levels can be affected by what we consume. When there is more cholesterol than the body's natural mechanisms for dealing with it, cholesterol can stick to the inner walls of blood vessels and narrow them. Since the liver uses it to make cholesterol, consuming too much saturated fat can raise blood cholesterol significantly. Fatty red meat and dairy products are the most important sources of dietary cholesterol and saturated fat (NR Astuti, 2015)

Dyslipidemia is a term that refers to a disorder of fat metabolism characterized by an increase or decrease in the proportion of fat in the blood. These blood fats can be in the form of cholesterol or triglycerides which are mostly formed in the liver from high-calorie foods such as (fats and carbohydrates) that are eaten in excess. Dyslipidemia is characterized by high levels of total cholesterol, LDL cholesterol and triglycerides, and low levels of HDL cholesterol. This disease can occur in all age groups. The cause can be genetic or inherited disorders or changes in habits and lifestyle, such as lack of physical activity, increased stress, or changes in diet. But actually this disease can be overcome by the existence of medicinal plants that are easily found around us, Therefore, researchers are interested in knowing how to use *luffa acutangula* (oyong) as a high cholesterol-lowering herb in the elderly, due to the development of traditional medicine for this disease. medicine is very important because almost all tribes living in every corner of the country know and use it (S Dalimartha and FA Dalimartha, 2014).

Oyong plants can also be used for various treatments such as jaundice, enlarged lymph nodes, diuretics and laxatives. Antiproliferative, antiangiogenic, antioxidant, hepatoprotective, antifungal and antibacterial effects have been observed in cucumber plants. In addition, Oyong has antihyperglycemic and antihyperlipidemic effects (Shendge and Belemkar, 2018).

Previous research conducted by Daniek Viviandhari et al. 2020, Extract fractions (ethyl acetate, n-hexane, and water) at a dose of 36.75 mg/kg BW and ethanol extract at a dose of 240 mg/kg BW of oyong fruit have activity in reducing total cholesterol, LDL and triglyceride levels in hyperlipidemic hamsters . The ethyl acetate fraction at a dose of 36.75 mg/kgBW is the fraction that has a comparable effect to the positive control and is the most effective fraction in reducing total cholesterol, LDL and triglyceride levels.

Based on the results of the preliminary research, a study was conducted on the Oyong fruit. The chemicals used in this study were suspending agents (Na-CMC), quercetin, AlCl3, sodium acetate, methanol, ketamine, and the solvents used to make extracts and fractions, namely 70% ethanol, ethyl acetate, n-hexane, and aquades. Besides that, the researchers also used drip reagents for phytochemical screening. The comparator drug used was generic atorvastatin 10 mg produced by PT. Hexpharm Jaya purchased at a Generic pharmacy, Tegal Parang Jakarta Activity of the Ethanol Extract Fraction of *Luffa acutangula* (L.) Roxb. on Cholesterol Reduction in Hyperlipidemic Hamsters 47

South and fenofibrate 200 mg generic produced by PT Medikon Prima Laboratories Tangerang, Indonesia purchased from Kimia Farma Pharmacy. The diagnostic kit materials used were total cholesterol, LDL and triglyceride reagent kits (Human, Germany). The inducer is high-fat feed (a mixture of egg yolks and beef fat). The test animals in this study were 32 male Sirian hamsters, aged 3-4 months, with a body weight of 50-100 grams. Animals were obtained from the Bogor Agricultural Institute (IPB) at the Faculty of Animal Husbandry, Non-Ruminants and Hopeful Animals Section. The study used 8 groups of test animals consisting of 4 hamsters. Animals were obtained from the Bogor Agricultural Institute (IPB) at the Faculty of Animal Husbandry, Non-Ruminants and Hopeful Animals Section. The study used 8 groups of test animals consisting of 4 hamsters. Animals were obtained from the Bogor Agricultural Institute (IPB) at the Faculty of Animal Husbandry, Non-Ruminants and Hopeful Animals Section. The study used 8 groups of test animals consisting of 4 hamsters.

This study aims to determine the effect of the intervention of giving *luffa acutangula*/oyong on reducing total cholesterol levels in the elderly. Giving for 14 days.

B. RESEARCH METHODS

This type of research is quantitative research, using an experimental method (pre-experimental) which aims to determine the intervention of giving *luffa acutangula*/oyong juice to reduce cholesterol levels in the elderly. with a one group pretest posttest design, namely a design that does not use a comparison group (control), but makes the first observation (pretest) which allows testing the changes that occur after an experiment (program).

C. RESEARCH RESULT

1. Univariate analysis

Table 1 Frequency distribution of the characteristics of respondents with high cholesterol levels in the elderly

Characteristics of Respondents	Intervention	Percentage
Gender		
Man	11	40.7%
Woman	16	59.3%
Age		
≥ 60 years	10	66.7%

≤ 61 years	2	33.3%
Family History		
Not	19	70.4%
Yes	8	29%
Physical activity/exercise		
Not	9	33.3%
Yes	18	66.7%
Education		
SD	3	11.1%
JUNIOR HIGH	6	22.2%
SCHOOL	11	40.7%
SENIOR HIGH	7	25.9%
SCHOOL		
College		

Based on table 1, the results of the distribution of the characteristics of respondents based on age of the 27 respondents on average aged ≥ 60 years were more, namely 18 respondents (66.7%), and aged ≤ 61 years by 9 respondents (33.3%). The distribution of respondent characteristics based on male sex was 11 respondents (40.7%), and female sex was 16 respondents (59.3%). The distribution of respondent characteristics based on family history found that 19 respondents (70.4%) did not have a history of high cholesterol levels and 8 respondents (29.6%) had a history of high cholesterol levels. The distribution of the characteristics of respondents based on physical activity/exercise was found as many as 9 respondents (33.3%) who did not carry out physical activity/exercise every day, The distribution of respondents' characteristics based on education was obtained by 3 respondents (11.2%) with last elementary school education, 6 respondents (22.2%) with last junior high school education, 11 respondents (49.7%) with last high school education, and 7 respondents (25 .9%) with college education.

Table 2 DistributionFrequency of cholesterol levels before administration
Luffa Acutangula Juice

Category	Frequency	Percentage
Normal	0	0%
Tall	27	100%
Total	27	100%

Based on table 2, it can be seen that high cholesterol levels in the elderly before being given *luffa acutangula* juice therapy in Jatimakmur Village, Pondok Gede District

Bekasi City In 2022, there are 27 respondents (100%) who have increased high cholesterol levels.

Table 3 Frequency distribution of cholesterol levels after administration *Luffa Acutangula Juice*

Category	Frequency	Percentage
Normal	27	100%
Tall	0	0%
Total	27	100%

Based on table 3, it can be seen that high cholesterol levels in the elderly before being given *luffa acutangula* juice therapy in Jatimakmur Village, Pondok Gede District, Bekasi City, in 2022, there were 27 respondents (100%) who experienced an increase in high cholesterol levels.

2. Normality test

Table 4 Results of the Kolmogorov-Smirnova and Shapiro-Wilk Normality Tests

Measurement	Category	Treatment Method	Shapiro-Wig Sig
Pre-test	Decreased cholesterol levels	*Luffa acutangula juice*	0.436
Post test	Decreased cholesterol levels	*Luffa acutangula juice*	0.057

Based on table 4 the results of the univariate normality assumption test in table 5.4 the measurement of reduced cholesterol levels pre-test has a Shapiro Wig value of 0.436 because the p value > 0.05 (greater than the alpha value) then HO is accepted. In measuring cholesterol levels, the post test has a Shapiro Wig value of 0.057 because the p value > 0.05 (greater than the alpha value) then Ho is accepted. So therefore the assumption of normality or otherwise normally distributed.

3. Bivariate Analysis

Table 5 Analysis of Decreased Cholesterol Levels in the Elderly Before and After *Luffa Acutangula* Juice Therapy

	Category	freq		Means		Mean Difference	SD difference	P Value
		Before	After	Before	After			
Intervention	Before intervention	27	0	285.81	179.44	106,370	2,923	0.000
	After intervention	0	27					

Based on table 5.5 the results of the analysis of reducing cholesterol levels after being given *luffa acutangula* juice therapy decreased cholesterol levels in the elderly to 100%. The results of the average analysis showed that the condition of cholesterol levels in elderly respondents who received *luffa acutangula* juice therapy decreased by 106,370 with p-value < 0.05. Based on the above data that at 95% there is an effect of giving *luffa acutangula* juice on reducing cholesterol levels in the elderly.

D. DISCUSSION

1. Research Limitations

While carrying out this research in Jatimakmur Village, Pondok Gede District, Bekasi City. Researchers realize that there are not a few limitations/obstacles encountered in the process of preparing proposals, research and consulting supervisors. Researchers feel constrained because this research activity must be consulted online so that sometimes it takes a lot of time to understand it.

Limited access to data collection, lack of data on elderly people with high cholesterol, making it difficult for researchers to collect data. So it takes a long time for the data collection process.

This research is inseparable from the limitations that occur, namely:

1. Unwillingness of the elderly who suffer from high cholesterol were used as respondents in this study.
2. Lack of participation from the family in helping carry out this research.
3. The time allotted for collecting and collecting research data was very short, which affected the limited number of samples and affected the quality of the research.

2. Characteristics of Respondents

The results showed the effect of age on cholesterol on 27 respondents, namely, at the age of respondents > 60 years there were 18 respondents (66.7%) and aged <61 as many as 9 respondents (33.3%) suffered from high cholesterol levels by examining total cholesterol. Based on the results of this study, it shows that there is an effect on cholesterol levels with age in the elderly > 60 years and over as age increases. As you get older, you are at greater risk of increasing your cholesterol level.

The results of this study are in line with research conducted by Ibrahim and Andika (2020), age affects cholesterol levels, almost all respondents are over 45 years of

age, namely 90 respondents (93.8%), that means age over 45 years are at risk of having high cholesterol levels and experiencing heart disease. It can be seen that heart disease is common in middle adulthood to the elderly. This is because the older a person is, the less activity he does, while the fat tissue increases.

The age category update from WHO 2020 is quite surprising considering the upper age limit for youth is 65 years. That means, people aged 60 years cannot be classified as parents. Consideration of this age division is adjusted to the ability of people in activities. The elderly or senior age group is intended for those aged 80 and over considering the limited activities they can still do. Meanwhile, those under 65 years of age are still considered young or mature because there are still many activities that can be done by people in that age range. Although the latest classification from WHO is different, it is hoped that this new age division can make it easier to improve human life. According to Dwijowati and Aulia (2021) Based on the results of the study, it showed that there was a relationship between age and all age levels of cholesterol levels, but the older the percentage of respondents with high cholesterol increased, so it can be interpreted that the older they get, the more risky they are of increasing cholesterol levels.

The results showed that gender also had an effect on cholesterol, there were 11 male respondents (40.7%) and 16 female respondents (59.3%). According to researchers Gender women are more at risk of developing high cholesterol because at approaching menopausek The level of the hormone estrogen decreases drastically so that women lose their protective factor. This is what causes women to experience high cholesterol more easily and its various complications during old age / (> 55 years). The results of this study are in line with research conducted by Cynthia et al, 2022, concerning the Effect of Alberry Smoothie on Reducing Cholesterol Levels in Hypercholesterolemia Patients, it is known that of the 60 respondents with hypercholesterolemia patients in the treatment group, the female sex was higher than the male sex, as many as 26 people (86.7%), while in the comparison group the female sex was higher than the male sex by 24 people (80%).

By the age of 45, women will lose 30-50% of their total muscle mass. This is due to the aging process, the body's metabolism will naturally slow down and low mobility speeds up the process of replacing muscle mass with body fat. Decreased muscle mass helps to reduce calorie consumption and almost every food is converted to fat. Before menopause, estrogen functions to increase protein anabolism and the formation of HDL

and LDL. This hormone also reduces LDL concentrations so that the risk of atherosclerosis is low. Meanwhile, menopausal women experience estrogen deficiency resulting in increased cholesterol levels so that the risk of atherosclerosis increases (Silbernagl, 2018)

The results showed that 8 respondents (29.6%) had a family history of cholesterol sufferers and 19 respondents (70.4%) did not have or did not know a family history of cholesterol. According to researcherssomeone with a family history that tends to have high cholesterol levels, has the talent to experience the same thing. The risk of having a health disorder is usually 6 times greater for children than parents. This genetic disorder is known as familial hyperlipidemia and familial hypertriglyceridemia (Ruslianti, 2014)

Research conducted by Rizki (2019) concerning the relationship between fat intake, cholesterol and nutritional status with cholesterol levels in outpatient hypercholesterolemia patients at dr. Moewardi Surakarta, that genetic abnormalities in the genes that regulate fat metabolism can also affect cholesterol levels. Usually this disorder is inherited from both parents. The heterozygous offspring have only half the normal number of LDL receptors. The absence or lack of hepatic LDL receptors causes patients with familial hypercholesterolemia to be unable to regulate LDL levels in the blood and produce very high plasma LDL concentrations at a very young age.

In Alfiah's research (2022) explained that as much as 80% of cholesterol in the blood is naturally produced by the body. The existence of hereditary factors causes a person to produce more cholesterol than other people even though they only eat a little food that contains cholesterol or saturated fat. The presence of the element homocystine in the blood which is a genetic component can also trigger an increase in cholesterol. This element can increase the activity of platelet hypercoagulation cells, impaired function of the inner lining of blood vessels (endothelium) and oxidation of LDL cholesterol. If someone has familial hypercholesterolemia (hereditary hypercholesterolemia) it will cause high cholesterol levels to go down in the family.

The results showed that 18 respondents (66.7%) did physical activity and 9 respondents (33.3%) did not do physical activity. According to researchers Physical activity is known to affect cholesterol levels in the blood. Physical activity in the form of

regular exercise can lower cholesterol levels in contrast to respondents who do not exercise, so cholesterol levels will be high.In this study, most of the respondents did not exercise. Someone who doesn't do sports can be caused by not having time to exercise, don't like exercising, don't have the strength to exercise anymore, or have the desire to exercise but often forget the next day.

According to Ibrahim and Andika (2020), the researcher's analysis is in accordance with the data found that 12 people (85.7%) out of 14 respondents who had light exercise activities had high cholesterol levels and 4 people (66.7%) out of 6 respondents Those who exercise heavily have normal cholesterol levels. Physical activity is a body movement produced by skeletal muscles and requires energy, including activities carried out at work, play, doing household chores, traveling and recreational activities. Types of physical activity such as walking, gardening, working in the garden, washing clothes, washing cars, mopping floors, going up and down stairs, push-ups, light running, playing ball, swimming, gymnastics, playing tennis, yoga, fitness and lifting burden (Mia Purnama, 2020).

Research conducted by Rafiq and Wicaksana (2020) about ps Influence of Physical Activity on Weight Loss and Cholesterol Levels in People with Obesity: Literature Review, The result shows that physical exercise affects cholesterol reduction. There was a significant reduction in cholesterol (-23 mg/dl; p<0.01) after resistance training, (-22 mg/dl; p<0.0001) after exercise, (-6; p<0.01) after doing physical exercise, (-6.86 mg/dl; p=0.618) after doing aerobics and walking exercise, (-9 mg/dl; p=0.001) after physical exercise and maintaining a diet, (-5.1 mg/dl; p=0.001) after doing high-intensity exercise, (-7.94%; p=0.001) after doing aerobic exercise in the form of a combination of jumping.

The results showed that 3 respondents (11.1%) had elementary school education, 6 respondents (22.2%) had junior high school education, 11 respondents (40.7%) had high school education, and 7 respondents (25.9%) had university education. According to researchers, the level of education influences the respondent's knowledge of cholesterol disease and how to prevent it. The level of education is very important in increasing knowledge, the higher the level of education, the easier it is to understand and accept the information provided. Conversely, a lack of education will hinder the development of one's attitude towards newly introduced values. Education is very closely related to

patient knowledge in receiving information from counseling, which can increase patient knowledge.

According to (Notoatmodjo, 2012) Health education is an effort or activity to create community behavior that is conducive to health. This means that health education seeks to make people aware of or know how to take care of their health, how to avoid or prevent things that are detrimental to their health and the health of others, where to seek treatment when sick and so on.

Research conducted by Renityas (2019) concerning health education about cholesterol effectively increasing the knowledge of the elderly in cholesterol prevention, showing that the respondent's knowledge of cholesterol prevention before treatment was carried out by 15 or 53.6% of respondents had insufficient knowledge. The results of the study proved that about 12 of the respondents had junior high school education or the equivalent. This means that the majority of respondents' education level is still low. One of the factors that influence knowledge is the level of education, where a higher level of education affects one's perception in making decisions and acting.

The results of this study are in line with research conducted by Sartika et al, 2019, regarding relationship between cholesterol levels and blood pressure in hypertensive patients at RSU Royal Prima Medan in 2019, based on high school education as many as 16 people (53%) and a minority of junior high school as many as 14 people (47%). Education affects one's knowledge in receiving information. The majority of sufferers have high school education so that knowledge about hypertension has never been received. Education plays a role in changing behavior related to one's health. Education is very influential, the higher the level of education, the higher a person's knowledge of the disease he suffers so that the better the person knows the prevention and treatment and vice versa, the lower the level of education of a person, the lower a person's knowledge of the disease he is suffering from and the worse a person knows how to treat it prevention and treatment of the disease.

From the discussion above, based on age, gender, family history, physical activity, and education, it is very influential in increasing cholesterol levels in the elderly in Jatimakmur Village, Pondok Gede District, Bekasi City in 2022. In the pharmacological treatment of high cholesterol levels, drugs are given to reduce levels. cholesterol by being given drugs from the statin group.But long-term use will cause side effects that are not

good. Therefore, nonpharmacology is needed as an alternative to reduce cholesterol levels in the elderly.

3. The effect of *luffa acutangula*/oyong juice in reducing cholesterol levels in the elderly

From the results of statistical analysis through the Paried T-Test with the help of SPSS 25, the results obtained were p value = 0.000 ≤ 0.05, so Ha was accepted, meaning that there was an effect of giving *luffa acutangula* juice on reducing cholesterol levels in the elderly in Jatimakmur Village, Pondok Gede District, Bekasi City in 2022 In this study, there was a significant change in cholesterol levels after being given the intervention of *luffa acutangula* juice for 14 days. This means that there is a significant effect between before the intervention and after the intervention.

Research conducted N.A. Rahma, 2019, This study used male white rats (*Rattus norvegicus wistar strain*) according to the criteria of 25 rats which were divided into 5 groups, namely negative control group (K-), positive control (K+), first treatment (D30), second treatment (D50). , and treatment three (D70). The K- group was a group of rats that were given standard feed without being given an atherogenic diet or Oyong fruit extract. The K+ group was a group of mice that were given an atherogenic diet for 8 weeks without being given Oyong fruit extract.

The results of the linear regression equation that has been carried out show that the regression line between giving Oyong fruit extract and triglyceride levels in white rats leads to the lower right, meaning that giving treatment in the form of Oyong 46 fruit extract tends to decrease triglyceride levels in white rats, compared to triglyceride levels in white rats in the group positive control.

The results of this study are also in line with research conducted by Daniek Viviandhari et al. 2020, Extract fractions (ethyl acetate, n-hexane, and water) at a dose of 36.75 mg/kg BW and ethanol extract at a dose of 240 mg/kg BW of oyong fruit have activity in reducing total cholesterol, LDL and triglyceride levels in hyperlipidemic hamsters . The ethyl acetate fraction at a dose of 36.75 mg/kg BW is the fraction that has a comparable effect to the positive control and is the most effective fraction in reducing total cholesterol, LDL and triglyceride levels.

The aim of giving the intervention of *luffa acutangula* juice has been achieved, namely the respondent is willing to be given the intervention of *luffa acutangula* juice

with a dose 240 mg/200 gram BW carried out for 14 days. From the results of the intervention carried out by the researchers for 2 weeks, there was a decrease in hypercholesterolemia levels. From the results of the analysis of research data and the description of the theory above, the researcher can conclude that the content of *luffa acutangula*/oyong is useful for reducing hypercholesterolemia levels.

E. CONCLUSION

Based on the results of research on the effect of giving *luffa acutangula* juice on cholesterol reduction, it can be concluded that:

1. Analysis of the combination of giving *luffa acutangula* juice was given once a day for 14 days by 27 respondents.
2. There is a decrease in cholesterol levels in the elderly by 27 respondents (100%).
3. There is an effect of giving *luffa acutangula* juice on reducing cholesterol levels in the elderly in Jatimakmur Village, Pondok Gede District, Bekasi City in 2022.

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