The Effect of Green Tea Leaf Decoction on Changes in Cholesterol Levels in the Elderly in Losari Village, Gondang District, Nganjuk Regency

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ABSTRACT

Complex changes in the elderly often cause health problems, one of which is an increase in blood cholesterol levels. Total cholesterol in the blood increases with the aging process. Cholesterol is a form of fat that the body needs. Cholesterol can cause problems if the levels are excessive. The purpose of this study was to determine the effect of giving green tea leaf decoction to changes in cholesterol levels in Losari Village, Gondang District, Nganjuk Regency as many as 26 respondents. The results of this study indicate that the cholesterol levels before being given the decoction of green tea leaves are mostly in the high cholesterol category, namely 15 respondents (58%) and the cholesterol levels after being given the decoction of green tea leaves, half have the category of normal cholesterol levels, namely 13 respondents (50%). sufficient, namely 13 respondents (50%). Wilcoxon test results show that p value = 0.001 ≤ α = 0.05. so that Ha is accepted, meaning that there is an effect of giving green tea leaf decoction to changes in cholesterol levels in the elderly in Losari Village, Gondang District, Nganjuk Regency.

I. Introduction

Elderly is someone who is over 60 years old biologically has characteristics that can be seen significantly in physical, mental, psychosocial and spiritual changes (Nugroho, 2008). Many changes that occur in the elderly include changes in body composition, muscles, bones and joints, the cardiovascular system, respiration and cognition. Complex changes in the elderly often cause health problems, one of which is an increase in blood cholesterol levels. Total cholesterol in the blood increases in line with the aging process (Ambardini RA, 2008). Cholesterol is a form of fat that the body needs. Cholesterol can cause problems if the levels are excessive (Wijayakusuma, 2008). One of the non-pharmacological handling of cholesterol is with herbal green tea which can reduce cholesterol levels (Indrawati, 2014). Data WHO World Health Organization penyakit yang disebabkan oleh hiperkolesterolemia atau kardiovaskular penyebab kematian sebesar 31% diseluruh dunia atau 17,9 juta jiwa orang pada tahun 2016 (Stenly Mala dkk, 2019) . Berdasarkan Pusat Data dan Informasi (Pusdatin) tahun 2013 di Indonesia angka kejadian tingginya kolesterol sebesar 35,9% . Menurut RISKESDAS (2018) prevelansi hiperkolesteroemia di jawa timur sebanyak 30, 38 %.

Many factors cause an increase in cholesterol levels, namely genetic factors, obesity factors, diet factors and rarely exercise (Sasongko, 2013). High cholesterol levels in the blood have an important role in the process of atherosclerosis which in turn will cause cardiovascular disorders and what often happens is in women after menopause, this is due to reduced activity of the hormone estrogen after women reach menopause (Ujani, 2015).

Many cohort studies have shown that the higher the blood cholesterol level, the higher the cardiovascular event rate. Basically cholesterol can be lowered and prevented before it turns into bad cholesterol in the body which can cause disease. The impact of increasing cholesterol in the blood of the elderly early on can trigger disease complications such as hypertension, diabetes mellitus, heart disease and stroke (Haryana, 2009).

Green tea has the highest polyphenol content and has biochemical activities, such as inhibiting bacterial mutation, inhibiting HIV activity, anti-tartar, antiviral, preventing the effects of cancer, capturing free radicals, and inhibiting the oxidation of bad cholesterol (LDL) (Shah, 2006). The content of polyphenols increases energy expenditure causing a reduction in body fat which has an effect on reducing cholesterol levels. Another mechanism is a decrease in cholesterol levels that occurs due to inhibition of the absorption of cholesterol and triglycerides. Catechins can also maintain and regenerate other antioxidants and function to restrain the formation of free radicals. Another mechanism by which polyphenols lower cholesterol levels is by reducing the activity of HMGKoA reductase, the activity of the enzyme acl-CoA cholesterol acyltransferase (ACAT) and reducing cholesterol absorption in the digestive tract. (Artha, dkk. 2017).

Research by Sriyono and Jujuk (2012) shows that green tea can reduce blood cholesterol levels. Consuming green tea periodically without sugar can reduce cholesterol in the body (Djohan, 2012). Knowledge of the general public about hypercholesterolemia can be achieved by the role of nurses as health workers in carrying out their role as educators in administering herbal medicines, where health workers understand and understand more about herbal medicines.

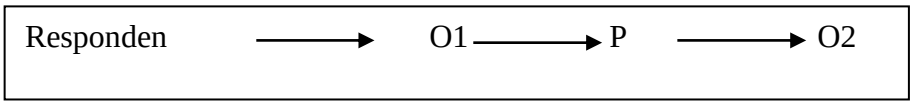
II. Methods

A. Research Approach

The research design uses a pre-experimental research type with a one group pretest-posttest design approach. By providing treatment in the form of giving boiled water 2 times per day for 7 days in the morning and evening. Respondents measured cholesterol levels using pre and post GCU.

The following is a research design table that will be used in this study

Table 1 Research Design



Describtion :

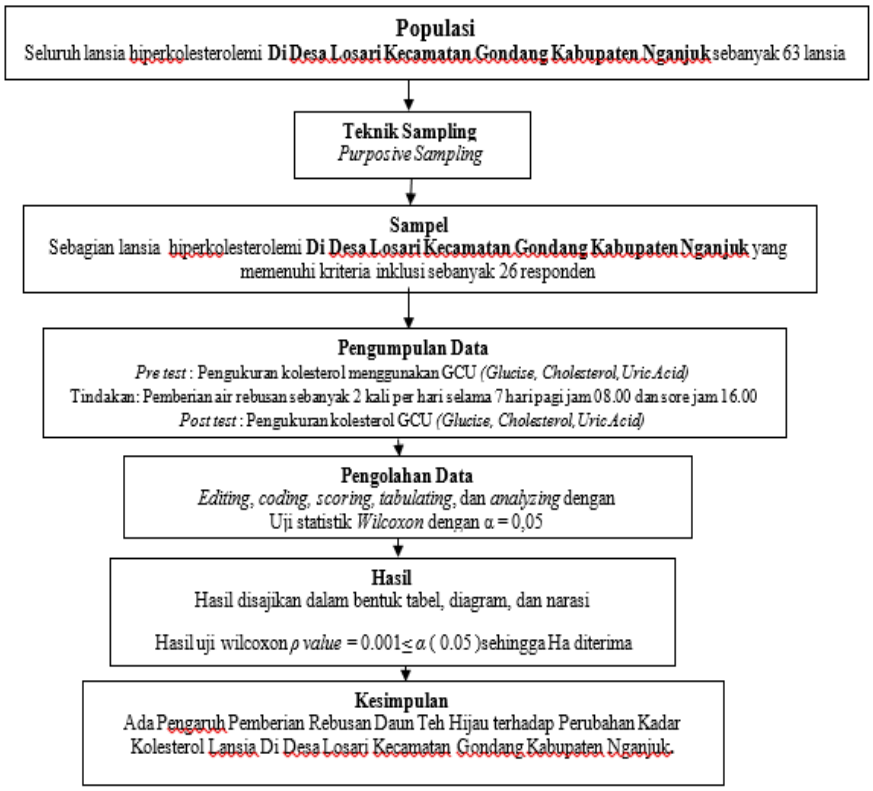
O1 : Observation of cholesterol levels in the elderly before being given green tea leaf decoction

P : The treatment of giving decoction of green tea leaves

O2 : Observation of cholesterol levels in the elderly after being given a decoction of green tea leaves

B. Framework

1. Figure Framework



2. Population

The population in this study were all hypercholesterolemic elderly people in Losari Village, Gondang District, Nganjuk Regency, as many as 63 elderly.

3. Sample

By using a purposive sampling technique, a sample of 26 respondents was obtained with the following criteria:

a) Inclusion criteria
   1) The elderly who have a history of cholesterol are female.
   2) Elderly who do not complain of constipation, nausea, increased stomach acid.
   3) Elderly who are willing to be respondents

b) Exclusion criteria
   1) Have normal cholesterol levels 20 elderly
   2) Uncooperative 4 elderly
   3) Sick 5 elderly
   4) None at home 8 elderly

4. Research design

Pre eksperimen dengan pendekatan *one group pretest-posttest desain.*

5. Research variable

a) The independent variable is the administration of green tea leaf decoction.
b) The dependent variable is cholesterol levels in the elderly.

6. Data Collection and Processing

a) Research Instruments
   1) Variabel Independen yaitu pemberian rebusan daun teh hijau (SOP)
   2) Variabel Dependen yaitu kadar kolesterol pada lansia **(**Alat ukur menggunakan GCU)

b) Time and Location of Research

This research was conducted on 27 July - 2 August 2021 in Losari Village, Gondang District, Nganjuk Regency

c) Data Collection and Testing Procedures

1) Data collection

The data collection method in this study was to measure cholesterol levels in the respondents using the GCU measuring instrument.

2) Testing Procedure

a. *Editing* : check the suitability of respondents with predetermined criteria

b. *Coding* : classification of general data (demographics) of research respondents (includes: gender, age, education, occupation and use of cholesterol drugs) and specific data (cholesterol levels include: high, moderate, low)

c. *Scoring* : special data screening (cholesterol level)

d. *Tabulating* : Grouping and calculating the amount of each variable, moving the grouped variables into the frequency distribution table

e. Data analysis : using the Wilcoxon statistical test with $\alpha = 0,05$, if the p-value $\leq \alpha$: 0.05 then Ha is accepted, if the p-value $> \alpha = 0,05$ then Ha is rejected.

III. Results and Discussion

A. Characteristics of Respondents

Table 2 : Characteristics of Respondents

Category	Frequency	Percentage
1. Gender		
a. Woman	26	100
2. Umur		
a. 45-59 years	11	42
b. 60-74 years	9	35
c. 75-90 years	6	23
3. Last Education		
a. Not completed in primary school	7	27
b. Elementary school		
c. Junior high school	9	35
	10	38
4. Work		
a. Housewife	3	12
b. Farmer	17	65
c. private/self-employed	2	8
d. Retired	4	15
5. Cholesterol treatment		
a. Yes	7	73
b. No	19	27

Characteristics of respondents Most were female, namely 26 (100%), did not take cholesterol medication, namely 19 (73%) and worked as farmers, namely 17 (65%).

B. The Effect of Green Tea Leaf Decoction on Changes in Cholesterol Levels in the Elderly

Table 3 Tabulation of the Effect of Green Tea Leaf Decoction on Changes in Cholesterol Levels in the Elderly

Cholesterol Levels	*Pre test*	*Post test*

	Frequency	Percentage	Frequency	Percentage
Normal	0	0	13	50
Enough	11	42	13	50
High	15	58	0	0
Total	26	100	26	100

Wilcoxon test : *p value* = 0, 001 ≤ α = 0,05

The Wilcoxon test results show that p value = 0.001 ≤ α = 0.05 so that Ha is accepted, meaning that there is an effect of giving green tea leaf decoction to changes in cholesterol levels in the elderly in Losari Village, Gondang District, Nganjuk Regency.

Green tea is a type of tea that does not undergo a fermentation process but undergoes a slightly longer drying and evaporation process than other teas. All types of tea contain tea polyphenols or often called catechins, but green tea is more popular because the polyphenol content is higher than black tea (Prihatmo, 2012). Green tea has a high polyphenol content. Tea polyphenols are powerful antioxidants that can protect against LDL-cholesterol oxidation and free radicals (Noni, 2007). These free radicals damage blood vessels and leave protein waste that causes plaque which can clog blood vessels (Lingga, 2012). Green tea is also effective in reducing bad cholesterol in the blood and increasing the ratio of good cholesterol.

Research on the effect of drinking green tea on cholesterol levels shows that green tea lowers levels of low-density lipoprotein (LDL) cholesterol, the "bad" cholesterol. At the same time, green tea helps increase levels of high density lipoprotein (HDL), which is considered "good." There are certain compounds in green tea that help block cholesterol absorption in the digestive tract, while simultaneously aiding in the excretion process. Green tea also helps arteries stay clean by preventing the oxidation of LDL, which can lead to plaque buildup that increases your risk of having a heart attack or stroke. (Sarjani 2013).

Polyphenols contained in green tea as antioxidants help the work of the enzyme superoxide dismulate (SOD), which can get rid of free radicals, thereby reducing LDL, preventing high blood pressure and reducing the risk of cancer. Green tea contains 6 times more potent antioxidants than black tea (Alamsyah, 2006). Tea polyphenols or often called catechins are unique substances because they are different from the catechins found in other plants. The content of polyphenols increases energy expenditure causing a reduction in body fat which has an effect on reducing cholesterol levels. Another mechanism is a decrease in cholesterol levels that occurs due to inhibition of the absorption of cholesterol and triglycerides. Catechins can also maintain and regenerate other antioxidants and function to restrain the formation of free radicals.

Another mechanism by which polyphenols reduce cholesterol levels is by reducing HMGKoA reductase activity, acl-CoA cholesterol acyltransferase (ACAT) enzyme activity and reducing cholesterol absorption in the digestive tract (Artha, et al. 2017). The catechins in tea are not tanning and do not adversely affect the digestion of food. Tea catechins are antimicrobial (bacteria and viruses), antioxidants, anti-radiation, lower cholesterol, strengthen blood vessels, promote urine secretion, and inhibit the growth of cancer cells. Catechins are the main group of green tea substances and are most influential in all tea components. In its processing, this colorless compound, either directly or indirectly, is always associated with all the properties of tea products, namely taste, color and aroma. Tea plant catechins are divided into two main groups, namely proanthocyanidins and polyesters. Green tea catechins are composed mostly of catechin compounds, (C), epicatechin (EC), galocatechin (GC), epigalocatechin (EGC), epicatechin error (ECG), galocatechin error (GCG), and epigalocatechin error (EGCG).

Several recent studies have stated that polyphenols have the strongest biochemical activity. The ability of polyphenolic compounds as antioxidants has been widely proven to be 100 times more effective than vitamin E (Shah, 2006). Based on the research by Ernawati, Lestariana, and Susetyowati (2014), the effect of giving green tea extract to adult female employees of the Yogyakarta City Health Office who are overweight and obese can significantly reduce total body fat (TLT). In addition, green tea extract can also change lipid profiles, namely decreased total cholesterol, decreased triglycerides, decreased LDL, and increased HDL.

Research by Sriyono and Jujuk (2012) shows that green tea can reduce blood cholesterol levels. Consuming green tea periodically without sugar can reduce cholesterol in the body (Djohan,

2012). In Astari's study (2017) which examined the effect of green tea on the elderly, it can be seen that cholesterol levels can decrease with a 7-day administration time, decreased cholesterol levels in green tea extract administration due to the presence of secondary metabolite compounds in green tea, namely, catechins which can improve blood lipid profile and has a vasoprotective effect.

Based on the results of this study, researchers argue that giving boiled green tea leaves to changes in cholesterol levels in the elderly in Losari Village, Gondang District, Nganjuk Regency has succeeded in experiencing changes in cholesterol levels. So that respondents can take advantage of green tea as a natural herbal medicine for the treatment of hypercholesterolemia to reduce the risk of worsening complications and mortality caused by hypercholesterolemia..

Therefore, giving boiled green tea leaves can be done routinely. Therefore, the nurse's job is to educate the elderly who have high cholesterol levels. Thus it is hoped that in the future, nurses as health workers have a role as educators for all people. So that more people know about green tea leaf decoction on changes in cholesterol levels.

IV. Conclusion

This study aims to determine the effect of giving green tea leaf decoction to changes in cholesterol levels in Losari Village, Gondang District, Nganjuk Regency. The results showed that the characteristics of the respondents who were influential were that the majority were female, did not take cholesterol medication and worked as farmers. All types of tea contain polyphenols (catechins), but green tea has a higher polyphenol content. These polyphenols are powerful antioxidants that can protect against the oxidation of LDL-cholesterol and free radicals. Green tea is also effective in reducing bad cholesterol in the blood and increasing the ratio of good cholesterol. Wilcoxon test results have the effect of giving green tea leaf decoction to changes in cholesterol levels in the elderly with a value of 0.001.

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