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Relationship between cholesterol levels and anxiety levels among hypertension patient in the community setting

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ABSTRACT

Background: Cholesterol is needed by humans for glucose metabolism and it also plays an important role in human energy metabolism. However, having too much cholesterol can also harm the individual himself, which can lead to the accumulation of fat in the blood.
Objective: The purpose of this study was to determine the relationship between cholesterol levels and anxiety levels on hypertension in the working area of Klatak Health Center.
Methods: The research design used a Correlation Study with a cross-Sectional research design. The study population was 70 respondents with hypertension and as many as 60 respondents were selected by using a purposive sampling technique. The research instrument used a cholesterol meter and an Anxiety Questionnaire Hamilton Rating Scale for Anxiety (HRS-A). Data analysis in this study used the Spearman Rank.
Results: The result of cholesterol levels with anxiety levels in patients with hypertension ($p = 0.003$; $r = 0.380$) which mean that there was a relationship between cholesterol levels and anxiety levels in the working area of Klatak Health Center.
Conclusions: The conclusion is that with better cholesterol levels in patients with hypertension then the level of anxiety in diseases will be reduced.

Keywords: anxiety; cholesterol levels; hypertension

INTRODUCTION

The National Institute of Heart, Lung, and Blood in Indonesia estimates that some people who suffer from hypertension will not be aware of their condition. Lack of physical activity can increase cholesterol levels in the body which is a risk factor for heart and blood vessel disease (Maryati, 2017). In a preliminary study in the Klatak Health Center Work Area, problems that occur in the field are lifestyles with the habit of eating fast food rich in fat, laziness to exercise in addition to increasing blood pressure, which will also increase cholesterol levels. High cholesterol levels or hypercholesterolemia can lead to fat storage in the blood (Ujiani, 2015). The buildup of fat in the blood is called cholesterol plaque. Cholesterol plaques can make blood vessels narrow so that blood flow becomes less

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- *An evidence that cholesterol has a relationship with anxiety level in patient with hypertension*
- *Anxiety management and health-related behavior should be promoted by nursing in community setting*

smooth. Lifestyle is also very influential on the form of behavior or habits of a person that has a positive or negative influence on health. Anxiety is a psychological factor that affects hypertension. This is supported by the opinion of (Handayani, 2022) in many people that anxiety or psychosocial stress can increase blood pressure.

The global prevalence of hypercholesterolemia in adults is 37% for men and 40% for women. Patients with total cholesterol in Indonesia according to RISKESDAS (Basic Health Research) data in 2018, there are 34,820 people consisting of several characteristics, this is also supported by data from PTM (Non-Communicable Diseases) in 2016, showing that the prevalence of high cholesterol is 52,3%. East Java Province occupies the 23rd position out of 34 total provinces in Indonesia, the prevalence is as high as 2,967 people who have high cholesterol detected from a total of 8,225 people who do the examination. The incidence of hypercholesterolemia shows a prevalence of 1,233 people, while the Klatak Health Center occupies the 3rd position in Banyuwangi Regency, which is 115 people (Banyuwangi Health Office, 2020). High cholesterol levels or hypercholesterolemia in the blood is also a trigger for hypertension. This is because high cholesterol is the cause of blockage in peripheral blood vessels which reduces blood supply to the heart (Soleha, 2012). Cholesterol is a modifiable risk factor for hypertension, so the higher the total cholesterol level, the higher the likelihood of developing hypertension (Sulastri et al., 2020). Hypertension has a relationship with total cholesterol lipid abnormalities, where the presence of dyslipidemia increases the risk of developing hypertension so the risk of cardiovascular morbidity and mortality increases (Firman, et al., 2020). Increased coronary heart disease (CHD) and hypertension occur epidemiologically in total serum cholesterol that exceeds 193.2 mg/dl. Cholesterol is a neutral fat that is used for the synthesis of hormones and folic acid in the liver. Cholesterol is located in tissues and plasma in the form of stored or free cholesterol. Lipoproteins transport both forms into the plasma. The four main lipoprotein groups are chylomicrons, very low-density lipoprotein (VLDL), low-density lipoprotein (LDL), and high-density lipoprotein (HDL). The function of each lipoprotein is different and is broken down and excreted differently.

Anxiety is closely related to an increase in blood cholesterol (Fauziah, at al., 2018). Hyperactivity of the nonandrogenic system can cause an increase in cholesterol levels in individuals with higher anxiety compared to individuals with lower anxiety levels (Lestari et al., 2015). Anxiety is confusion and worry about something that will happen with unclear causes and is associated with feelings of uncertainty and helplessness (Pramana et al., 2016). Anxiety can be expressed through physiological responses, where the body responds by activating the autonomic nervous system (sympathetic and parasympathetic). The sympathetic nervous system will activate the body's response, while the parasympathetic nervous system will minimize the body's response (Pratama, et al., 2020; Puspita, et al., 2020). The body's reaction to anxiety is "fight or flight" (the body's physical reaction to external threats), when the brain cortex receives a stimulus it will be sent through the sympathetic nerves to the adrenal glands which will release the hormone epinephrine (adrenaline) which stimulates the heart and blood vessels so that the effect is breath becomes deeper, pulse increases, and blood pressure increases or hypertension (Pramana et al., 2016).

To avoid high cholesterol levels, namely by not eating fatty foods, a healthy lifestyle, adequate rest, and can control anxiety. To reduce the level of anxiety, efforts can be made by doing relaxation techniques. The more often relaxation techniques are used, the more effective it is to reduce tension and anxiety. Progressive relaxation therapy is effective in reducing anxiety and stress. Based on the background of the problem above, the researcher is interested in conducting research on the relationship between cholesterol levels and anxiety levels in hypertension patients in the work area of the Klatak Health Center.

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METHODS

Design

The research design in this study used a cross-sectional research design, which is a type of research where the measurement or observation time is only once at a time on the data of the independent variable and the dependent variable (Nursalam, 2016).

Sample and Setting

The sample is part of the affordable population that can be the subject of research through sampling (Nursalam, 2016). The sample used was 60 people with hypertension in the working area of the Klatak Public Health. The sample in this study must meet the inclusion criteria. Inclusion criteria are general characteristics of research subjects from a target population that is affordable and will be studied (Nursalam, 2016). Inclusion criteria in this study were patients with hypertension who were recorded in the work area of the Klatak Health Center and patients with hypertension who were willing to become respondents. Exclusion criteria are eliminating or removing subjects who do not meet the inclusion criteria from the study for various reasons (Nursalam, 2016). Exclusion criteria in this study were hypertensive patients with mental disorders and hypertensive patients who were not present at the examination.

Variable

The independent variable is the variable that causes the dependent variable to arise (Nursalam, 2016). The independent variable in this study is cholesterol levels. The dependent variable is a variable that is influenced or positioned as a result of the emergence of an independent variable and is a factor that can be observed and measured by seeing whether there is a correlation or influence of the independent variable (Nursalam, 2016). The dependent variable in this study is the level of anxiety.

Instruments

Cholesterol levels can be done by using a cholesterol measuring device (cholesterol meter). When using a cholesterol meter, the results are classified as to whether cholesterol levels are in the good range, the upper threshold, or high. Anxiety level questionnaire using Hamilton Rating Scale For Anxiety (HRS-A). According to (Nursalam, 2013). The HRS-A questionnaire is an instrument used to measure anxiety levels such as mood, tension, physical symptoms, and worries. The HRS-A questionnaire consists of 14 groups of anxiety symptoms that are described more specifically. This questionnaire uses a score with a Likert scale range of 0-4, which consists of 0: no symptoms (no symptoms at all); 1: Mild symptoms (one symptom from the available options); 2: Moderate symptoms (half of the symptoms present); 3: Severe symptoms (more than present); 4: Severe symptoms (all symptoms present). With the measurement results, a score <14 indicates no symptoms of anxiety, a score of 14-20 indicates mild anxiety, a score of 21-27 indicates medium anxiety, a score of 28-41 indicates heavy anxiety, a score of 42-56 indicates very heavy anxiety. The researcher chose the HRS-A questionnaire as the research instrument because the HRS-A instrument has been proven to be a tool for measuring anxiety levels. The components contained in the HRS-A questionnaire are fewer than other instruments so that it can maintain the concentration of respondents to fill out the questionnaire carefully.

Ethical Consideration

The study received ethical approval from the Klatak Banyuwangi Public Health Center (No: 049/01/KEPK-STIKESBWI/II/2022).

RESULT

Based on the research in table 1, that cholesterol levels in the working area of the Klatak Health Center in patients with hypertension, mostly in the upper threshold category as many as 39 respondents (65%). This study is in line with research (Maryati, 2017) who obtained the results of cholesterol levels with the upper threshold category (more than 200-239 mg/dl). A factor that can affect cholesterol levels is age. According to (Maryati, 2017) age factor is very important in increasing cholesterol levels in the blood. Based on the results in table 3, 39 (65%) respondents had cholesterol levels in the upper threshold category and almost half of them were 26 respondents (43.3%) aged 46-55 years. Gender factors are also at risk for increased cholesterol levels. Based on the results in table 4, it was found that 21 (35%) of the respondents had cholesterol levels in the high category and most of the 36 respondents (60%) were women. The most of the anxiety levels in the heavy category were 35 respondents (58.3%),

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Table 1. Characteristics of respondents (n=60)

Charactersitics	n	%
Cholesterol Levels		
Threshold	39	65
High	21	35
Age		
46-55 years old	26	43.3
56-65 years old	23	38.3
>65 years old	11	18.3
Gender		
Male	24	40
Female	36	60
Anxiety Levels		
No symptoms	2	3.3
Mild	6	10
Medium	7	11.7
Heavy	35	58.3
Very Heavy	10	16.7

Table 2. Relation between cholesterol levels and anxiety levels of hypertension

Cholesterol	Anxiety						p	r
	No	Mild	Medi-um	Heavy	Very heavy	Total		
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)		
Threshold	2 (3.3%)	6 (10%)	5 (8.3%)	23 (38.3%)	3 (5%)	39 (65%)	0.003	0.380
High	0 (0%)	0 (0%)	2 (3.3%)	12 (20%)	7 (11.7%)	21 (35%)		
Total	2 (3.3%)	6 (10%)	7 (11.7%)	35 (58.3%)	10 (16.7%)	60 (100%)		

a small portion in the very heavy category were 10 respondents (16.7%), a small part in the medium category as many as 7 respondents (11.7%), a small part in the mild category as many as 6 respondents (10%), and also a small part that has no symptoms of anxiety as many as 2 respondents (3.3%).

Based on the results of the Spearman rank test, with a significance level of 0.05 (5%), obtained p = 0.003 then the alternative hypothesis is accepted and H0 is rejected, meaning that there is a relationship between cholesterol levels and anxiety levels in sufferers. Hypertension in the working area of the Klatak Public Health Center. With a close correlation of 0.380, it shows a correlation with low strength (Table 2).

DISCUSSION

The results showed that cholesterol levels in the working area of the Klatak Health Center in patients with hypertension, mostly in the upper threshold category as many as 39 respondents (65%). This study is in line with research (Maryati, 2017) who obtained the results of cholesterol levels in the upper threshold category (more than 200-239 mg/dl). High cholesterol in the blood is associated with blood pressure (hypertension), and narrowing and stiff blood vessel walls due to cholesterol in blood vessels can cause blood pressure. Several factors cause hypercholesterolemia. According to (Ujiani, 2015), the factors that can affect cholesterol levels are age and gender factors.

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This is in line with research (Rachmawati et al., 2021), 40 years of age increases the occurrence of hypertension due to natural changes in the body that affect the elasticity of blood vessels decreases and body resistance decreases, increasing age due to the aging process which makes people susceptible to disease. This is following the theory that states that cholesterol in the blood is getting thicker over time. With age, the thickening that occurs will increase and physical activity tends to decrease, and the metabolic rate will run slower due to the weakening of the body's organs. There is a relationship between cholesterol levels in patients with hypertension with the age of the respondent. This is due to changes in the structure of large blood vessels, so that blood vessels become narrowed and blood vessel walls become stiff and cholesterol increases.

Women have more free time than men. This is because after the age of 45, the number of women who suffer from hypertension which also triggers an increase in cholesterol will be higher than men because women are protected by female hormones during their productivity period (Dwipayanti, 2019). Mild anxiety levels are associated with tension in daily life which causes a person to be more alert and increases his perceptual space. Obtained from the results of the study, respondents experienced mild anxiety as many as 6 (10%) respondents. Signs that often appear in mild anxiety of respondents with hypertension with hypercholesterolemia from the results of the questionnaire include physiological responses, namely muscle stiffness, and frequent urination.

Medium anxiety levels make a person focus on things that are felt to be important to the exclusion of other aspects. Obtained from the results of the study, respondents experienced medium anxiety as many as 7 (11.7%) respondents. The signs that often appear in medium anxiety are respondents with hypertension with hypercholesterolemia from the questionnaire results, including physiological responses, namely difficulty sleeping, loss of interest, and changes in behavior when communicating. Heavy levels of anxiety can cause a person to tend to focus on something more detailed, specific, and unable to think about other things, and will require a lot of direction to focus on another object. From the results of the study, the respondents experienced heavy anxiety as many as 35 (58.3%) respondents. It was found that most of the respondents experienced heavy anxiety. Signs that often appear in heavy anxiety of respondents with hypertension with hypercholesterolemia from the questionnaire results include physiological responses, namely tension, difficulty sleeping, difficulty concentrating, decreased memory, muscle pain, muscle stiffness, frequent urination, and changes in urine output on behavior when communicating (Firman, et al., 2020).

Very heavy levels of anxiety (panic) related to the fear and terror of experiencing a loss of control. People who are panicking are unable to do anything even with direction (Elviani, et al., 2021). Signs that often appear in very heavy anxiety respondents with hypertension with hypercholesterolemia from the results of the questionnaire include physiological responses, namely anxiety, tension, difficulty sleeping, difficulty concentrating, decreased memory, muscle pain and stiffness, weakness, heart palpitations, frequent urination, headaches, and changes in behavior when communicating (Endriyani, et al., 2021).

Cholesterol is a modifiable risk factor for hypertension, so the higher the total cholesterol level, the higher the likelihood of developing hypertension (Sulastri et al., 2020). Lack of physical activity can increase cholesterol levels in the body which is a risk factor for heart and blood vessel disease (Maryati, 2017).

Anxiety can affect thinking skills, both thought processes and thought content, including not being able to pay attention, decreased concentration, easy to forget, decreased field of perception, and confusion (Pramana et al., 2016). Mild anxiety levels are associated with tension in daily life which causes a person to be more alert and increases his perceptual space. Medium anxiety levels make a person focus on things that are felt to be important to the exclusion of other aspects. Heavy levels of anxiety can cause a person to tend to focus on something more detailed, specific, and unable to think about other things, and will require a lot of direction to focus on another object. Panic anxiety levels are related to the fear and terror of experiencing a loss of control. People who are panicking are unable to do anything even with direction (Hidayat, et al., 2021).

There were 2 (3.3%) respondents in the category of upper threshold cholesterol with no symptoms of anxiety level. This is due to muscle stiffness and difficulty sleeping. In the category of upper threshold cholesterol with mild anxiety, 6 (10%) respondents were found.

This is because respondents with hypertension with hypercholesterolemia upper threshold signs that often appear from the results of the questionnaire include physiological responses, namely muscle stiffness and frequent urination (Mahardika, 2017). In the category of upper threshold cholesterol with medium levels of anxiety, there were 5 (8.3%) respondents. This is because respondents with hypertension with hypercholesterolemia upper threshold signs that often appear from the results of the questionnaire include physiological responses, namely difficulty sleeping, loss of interest, and changes in behavior when communicating (Kartika, et al., 2021; Kati, et al., 2018). In the upper threshold cholesterol category with heavy anxiety, 23 (38.3%) respondents were found. This is because respondents with hypertension with hypercholesterolemia upper threshold signs that often appear from the questionnaire results include physiological responses, namely tension, difficulty sleeping, difficulty concentrating, decreased memory, muscle aches, muscle stiffness, and frequent urination (Lestari, 2015). As well as changes in behavior when communicating. In the category of upper threshold cholesterol with a very heavy level of anxiety, 3 (5%) respondents were found. This is because respondents with hypertension with hypercholesterolemia upper threshold signs that often appear from the questionnaire results include physiological responses, namely anxiety, tension, fear of being left alone, difficulty sleeping, loss of interest, muscle pain and stiffness, weakness, heart palpitations, no appetite, frequent urination, headache, restlessness, and restlessness when communicating (Handayani, at al., 2019).

In the category of high cholesterol with medium levels of anxiety, 2 (3.3%) respondents were found. This is because respondents with hypertension with high hypercholesterolemia often have signs that often appear from the questionnaire results, including physiological responses, namely anxiety, tension, fear of the dark, difficulty sleeping, not sleeping well, waking up at night, loss of interest, muscle stiffness, weakness, decreased appetite, frequent urination, headache, restlessness, and restlessness (Melfa, et al., 2008; Mutawalli, et al., 2020; Wahyuni & Wahyuningsih, 1967). In the category of high cholesterol with heavy anxiety levels, 12 (20%) respondents were found. This is because respondents with hypertension with high hypercholesterolemia often have signs that often appear from the results of the questionnaire, including physiological responses, namely difficulty sleeping, not sleeping well, difficulty concentrating, nightmares, decreased memory, loss of interest, sadness, and fluctuating feelings. every day, decreased appetite, frequent urination, easy sweating, headache, restlessness, and restlessness. In the category of high cholesterol with very heavy anxiety levels, 7 (11.7%) respondents were found. This is because respondents with hypertension with high hypercholesterolemia often show signs of physiological responses, namely anxiety, tension, difficulty sleeping, difficulty concentrating, decreased memory, muscle pain, and stiffness, weakness, heart palpitations, frequent urination, headaches, changes in behavior when communicating.

CONCLUSION

The cholesterol levels in patients with hypertension in the working area of the Klatak Health Center were mostly in the upper threshold category and the level of anxiety in a severe category. From the statistical analysis, there was a relationship between cholesterol levels and anxiety levels in hypertension patient. This study can be a reference and basic information for nurses in the community settings.

Declaration of Interest

No conflict of interest.

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Data Availability

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

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