



CHOLESTEROL LEVELS OF HYPERTENSIVE PATIENTS IN PROLANIS EXERCISE

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Abstract

Hypertension causes 73% of deaths and 60% of all illnesses in the world. In Indonesia, hypertension is the number 3 cause of death after stroke and tuberculosis, which accounts for 6.7% of the population's deaths at all ages. Prolanis exercise is a program organized by BPJS as a preventive and promotive measure for hypertension. The research aims to determine the effect of prolanis exercise on cholesterol levels in patients with hypertension. The research hypothesis is whether there is an effect of prolanis exercise on the cholesterol levels of hypertensive sufferers. The research is a quantitative study with a cross sectional design. The research tool is an observation sheet. The research population was participants in prolanis exercise at the Kotabumi II Health Center with a sample size of 35 people. Data analysis using univariate and bivariate (*T test*). The results of the study showed that prolanis exercise had a significant effect on the cholesterol of Hypertension Program Patients (PPHT) at the Kotabumi II Community Health Center, the average initial cholesterol measurement was 222.53 mg/dl (SD= 47.06) and the average final cholesterol measurement was 128.80 (SD= 34.70). The average age of sufferers was 54.03 (SD = 7.23), the average person suffering from hypertension was 7.96 years (SD = 4.3), the average body mass index was 24.54 (SD = 4.75). There was a significant difference in initial and final cholesterol ($p=0.00$; $\alpha=0.05$) in patients with the Hypertension Disease Program (PPHT) Kotabumi II Health Center.

Keywords : Exercise, Cholesterol, Hypertension, Prolanis

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INTRODUCTION

The rapid increase in the incidence and prevalence of NCDs in the 21st century is a major health challenge in the future. WHO states that in 2020 PTM will cause 73% of deaths and 60% of all morbidity in the world. It is estimated that the countries that feel the impact the most are developing countries, including Indonesia (Rahajeng E & Tuminah S, 2009).

Hypertension is a non-communicable disease (NCD) caused by an epidemiological transition where socio-economic, environmental changes and changes in population structure occur, when people have

adopted unhealthy lifestyles, for example smoking, lack of physical activity, foods high in fat and calories, and alcohol consumption which is thought to be a risk factor for NCDs. Hypertension can be interpreted as an abnormal increase in systolic and/or diastolic blood pressure. The precise threshold for this disorder is uncertain. Acceptable values differ according to age and gender. However, generally, systolic ranging from 140 – 160 mmHg and diastolic between 90 – 95 mmHg are considered borderline hypertension. The diagnosis of hypertension is clear in cases where the systolic blood pressure exceeds 160 mmHg and the diastolic blood pressure exceeds 95 mmHg. These values are in accordance with the conceptual definition of hypertension, namely an increase in blood pressure that is associated with an increase in cardiovascular mortality of more than 50% (Price A. Sylvia and Wilson LM, 2010).

Hypertension is one of the main causes of death, both in developed and developing countries, including Indonesia. The prevalence of hypertension is almost 1 billion people (26%) in 2003 suffering from hypertension and it is estimated that by 2025 the number will increase to 29% (WHO, 2003). This needs attention because the prevalence rate is high and tends to continue to increase and the long-term consequences it causes, in fact hypertension is something that many people suffer from without even knowing it, especially in urban areas. Many people have experienced hypertension without knowing it for years. Therefore, hypertension is called the silent killer (Harefa, et al., 2009). the Causes of death in Indonesia are stroke and tuberculosis and hypertension, which accounts for 6.7% of the population of deaths at all ages in Indonesia (Margarita, et al., 2013). Of the several NCDs, hypertension is one of the diseases that has experienced an increase in the number of sufferers aged >18 years, namely 34.1% compared to the 2013 riskesdas, namely 25.8% of the Indonesian population, while in Lampung Province the prevalence of hypertension is 30% (Riskesdas, 2018).

Cholesterol is a risk factor for hypertension that can be changed, so the higher the cholesterol level, the higher the chance of hypertension. Because blood pressure increases due to excessive cholesterol deposits on the walls of blood vessels. (Susilo, et al 2011). High blood cholesterol levels are experienced by many people with high blood pressure. If these two factors are present high blood pressure and high cholesterol levels, they can interact with each other to more quickly damage the blood vessels and heart. So it can cause the risk of cardiovascular disease, heart attack and stroke.

In an effort to overcome chronic diseases, especially hypertension, PT Askes (Persero) designed a promotive and preventive format that is integrated into a management model called prolanis or Chronic Disease Management Program, including Hypertension. Hypertension can cause various complications, one of which is if the cholesterol level is high, if it affects the heart there is a possibility of myocardial infarction, coronary heart disease, congestive heart failure, if it affects the brain there will be a stroke, hypertensive encephalopathy, and if it affects the kidneys there will be chronic kidney failure, while If it gets into the eyes, hypertensive retinopathy will occur. Of the

various complications that may arise, this is a very serious disease and has an impact on the sufferer's psychology because their quality of life is low, especially in cases of stroke, kidney failure and heart failure.

Having a chronic disease management program or Prolanis at community health centers is a proactive approach that is implemented in an integrated manner involving participants, health facilities and BPJS Health in the context of maintaining the health of those suffering from chronic diseases to achieve optimal quality of life so that hypertension does not cause further complications. . Activities in prolanis include medical/educational consultation activities, home visits, reminders, club activities and monitoring health status. For hypertension sufferers, one of the activities that Prolanis encourages is club activities. Activities in this club include counseling and implementation of Prolanis exercises. With prolanis exercise, it will increase the impulse stimulus at the baroreceptor center in the carotid arteries and aorta. This impulse will go to the cardiovascular control center in the medulla oblongata through sensory neurons which will influence the work of the sympathetic nerves and release norepinephrine and epinephrine, and parasympathetic nerves which will release more ACH which affects the SA node which will lower blood pressure and can stimulate the activation of the lipase enzyme which will break down fat into free fatty acids and the more cholesterol that is broken down, the cholesterol levels will also decrease.

The health profile of North Lampung Regency, in 2018 the Kotabumi II Community Health Center had the largest number of sufferers with hypertension in North Lampung. Apart from that, at the Kotabumi II Community Health Center, hypertension is the second largest disease case after Common Cold. Based on information from the Hypertension management team, the Kotabumi II Community Health Center has carried out this prolanis exercise activity once a week with 45 regular participants. Yesiana's research, 2014, showed that healthy heart exercise carried out twice a week can reduce cholesterol levels, but in Siti Fatimah's research and Apoina Kartini (2011) stated that the average total cholesterol level of aerobic participants was 201.2 mg/dl lower than that of the housewife group of 208.2 mg/dl. There was no significant difference in total cholesterol levels. This study aims to determine the effect of prolanis exercise on cholesterol levels in patients with hypertension.

MATERIALS AND METHODS

This research uses a quantitative design with a quasi-experimental method with a one group pretest and posttest design approach. In this study, researchers aimed to determine the effect of prolanis exercise on cholesterol levels in hypertensive sufferers. The population in this study were hypertensive patients, members of the PPHT Club at Puskesmas Kotabumi II who were recorded in the register book at Puskmas Kotabumi II, totaling 30 participants. The number of samples in this

study was 35 respondents. The research was carried out at the Kotabumi II Community Health Center, Kotabumi Lampung.

Data collection tools are the "Easy Touch GCU" cholesterol measuring device to measure cholesterol observation results, and observation sheets. Researchers measured cholesterol levels using Easy Touch GCU, at the beginning of the activity carried out by health analysts, then respondents were asked to do exercise twice a week with a duration of 45 minutes, with the first 5 minute warm-up method by bending the head, bending the arms and legs 8 times. then 35 minutes of prolans exercise then 5 minutes of cooling down.

At the end of the activity after following 4 weeks, cholesterol levels were measured again by health analysts. And recorded on the observation sheet. This research was assisted by 3 enumerators from the community health center to ensure that the exercise movements were carried out in accordance with the SOP for prolans exercise movements

Analysis includes univariate and bivariate analysis. Bivariate analysis in the form of a frequency distribution which includes cholesterol levels before and after the intervention. This bivariate analysis was carried out to prove or test the hypothesis, namely the effect of exercise on cholesterol, using the t test, namely by comparing the cholesterol levels of PPHT patients before and after intervention for 1 month. To see the significance results used is 95% with a standard error of $\alpha=0.05$, if the p value ≤ 0.05 means there is a statistically significant relationship or H_a is accepted. Data on age, duration of hypertension, BMI, initial cholesterol levels and final blood pressure were analyzed using the Kolmogorof-Smirnov method. Meanwhile, the cholesterol variable before and after treatment (numerical) uses the dependent t-test statistical test. Confounding variables: body mass index and final cholesterol level using the person chi square statistical test.

RESULTS AND DISCUSSION

he results of research on cholesterol levels in respondents are presented in the following table, including the characteristics of respondents based on age, BMI, duration of hypertension, 1st (initial) cholesterol levels and 2nd (final) cholesterol levels. The number of respondents was 30 people.

Respondent characteristics

Table 1: Respondent characteristics

Variabel	Mean	SD	Min-max
Age	54,03	7,23	39- 70
Body Mass Indek	24,54	4,75	14,55- 32,40
Duration of hypertension	7,96	4,3	1-18

Cholesterol level 1	222,53	47.06	201-345
Colesterol level 2	128,80	34,70	100-245

Univariable analysis

Mean ost of age 54,03 dan body mass indek of responden is 24,54 and 14,55 to 32,40 duration of hypertension 7,96 and cholesterol l level 1 (before exercise prolanis) is 222,53 mg/dl and cholesterol level 2 (After exercise prolanis) 128,8 mg/dl

Table 2: Bivariable analysis cholesterol level of hipertension

Variable	Mean	SD	CI 5%	df	P value
Cholesterol 1 (before exercise)	222.51	47.06	79.184:108,28	29	0.00
Cholesterol 2 (after exercise)	128.80	34.70			

Analysis of confounding variables on final cholesterol values The strength of the relationship between the two variables in this study will be tested using the Pearson correlation test. The variables tested for the strength of the relationship were the final blood pressure value variable and the respondent's confounding variable. BMI confounding variable. The results of the Pearson Correlation analysis were that there was no relationship between body mass index and final cholesterol value ($p = 0.95$)

Another study with BMI, A study was carried out to relate body mass index (BMI) and waist circumference (WC) with glucose, cholesterol and triglycerides in 294 students with an average age of 20 enrolled in the bachelor's degree in Medical Surgery at a private school in Tuxtla Gutiérrez Chiapas in 2018. It was found that 36.4% of students were overweight and 12.9% were obese type I. No statistically significant difference was found between these variables, however, a tendency to overweight was observed in students who had normal values of glucose (34%), cholesterol (45%), triglycerides (36%), and with high values of these parameters 70%, 48% and 50% respectively. For WC, there was no significant difference between these variables, however, a high health risk for cardiovascular diseases was found in students with hyperglycemia (10%), hypercholesterolemia (16%), and moderate risk with hypertriglyceridemia (40%).

In this study, the average cholesterol value for the first assessment was 222.53 (SD = 47.06) and the average cholesterol value for the second assessment was 128.20 (SD = 34.70). After carrying out a statistical test, it was found that $p=0.000$ showed that there was a significant difference between the cholesterol values between the first and second measurements ($\alpha= 0.05$).

The results of this study are in accordance with research conducted by Galih Tri Utomo (2012) which stated that gymnastics training was proven to reduce body weight by 66.7%, body fat percentage decreased by 86.4% and cholesterol decreased by 27.6% in obese teenage girls. The same thing was also done by Lalarni, Khusnul Khotimah and Said Junaidi (2015) who said that prolanis exercise can increase body fitness and reduce fat in the elderly.

The decrease in body weight, body fat percentage and blood cholesterol levels was caused by the increase in physical activity of the sample, who previously did exercise only once a week during sports lessons at school, to 3 times a week with low intensity, where the source of energy needed came from burning body fat reserves. . This increase in physical activity causes the burning of body fat reserves to meet the body's calorie needs during aerobic exercise.

This is in accordance with the opinion of Lyne Bryck (2001) Peters, SAE, Singhateh, Y, Mackay, D, Huxley, (2016) states that biochemical processes are constantly taking place in our bodies. to obtain energy for each work movement. Aerobics done at low to moderate intensity for 30 minutes or more will burn fat. The prolanis exercise in this study was carried out with standards that respondents had to adhere to so that it had a good effect on hypertension sufferers, especially on blood pressure. In carrying out research there are several principles or provisions that are applied, namely: training time, safety, training duration, place, training procedures,

Training time is held in the morning at 07.00 - 07.45 WIB. This time was chosen because the morning air is still fresh, free from pollution and the temperature is not too hot, to avoid hyperthermia which can trigger loss of a lot of fluids from the respondent's body and to avoid respondents experiencing fatigue. The principle of safety by implementing health protocols is that participants wear masks and face shields, check temperature, maintain distance, wash hands and wear face shields. Likewise, when respondents come and go home, they are advised to wear a mask. Meanwhile, when exercising, respondents only wore face shields, to avoid transmission of Covid-19.

The training lasts for 45 minutes and is repeated 2 times a week. Each 45 minute workout consists of the first 5 minutes as stretching, the second 35 minutes of core training in the form of prolanis exercises and the last 5 minutes for cooling down or resting. Outdoor exercise area (out door). This situation has a positive effect and can be directly exposed to sunlight as a way to break the chain of transmission of Covid-19. Prolanis exercises are carried out in accordance with stages starting from preparation, warm-up, prolanis exercises and ending with cooling down.

The research results showed that there was an influence of Prolanis exercise on the respondents' cholesterol levels. Research conducted by Yesiana Dwi (2014) stated that modified cardiac exercise

and yoga were more successful in reducing serum cholesterol levels ($p= 0.001$) compared to non-modified ones. Modified cardiac exercise + yoga is a stimulator for the body, which, when done repeatedly and regularly, increases the physiological adaptive response of the body's organs.

The energy used for exercise, including gymnastics, is carbohydrate molecules and fat molecules. To be used as energy, both must be converted through the body's biochemical processes, namely lipolysis. Lipolysis in adipose tissue occurs due to a response to catecholamines during activity. According to Price & Wilson (2003), the release of catecholamines will also stimulate epinephrine and norepinephrine, these two hormones will activate lipase, so that the breakdown of fat into free fat will occur, then the free fat will be released into the blood and into the mitochondria, where it will occur. beta oxidation process that produces acetyl Co-A. Acetyl Ko-Aini will enter the Krebs cycle and will be converted into water, CO₂ and ATP. So cholesterol levels can decrease, which is caused by the breakdown of fat as energy. Lemura & Dullivard (2004) added that the breakdown of fat into energy can occur when doing Aerobic Exercise, because when doing aerobic exercise fat catabolism will occur. This is in line with research by Asep D Saputra et al (2015) which stated that after doing the poco-poco exercise for four weeks there was a statistically significant change in cholesterol levels.

Research conducted by Siti Fatimah and Apoirini (2011) states that aerobic exercise activities do not significantly affect the total cholesterol levels of adult women, because the difference in mean total blood cholesterol is only 7.1 g/dl, this result is not in line with the expectations of this study, namely 15 g/dl and when compared with research at the "St. Anna" Semarang city in 2008 (19.4 g/dl) and research in Amsterdam in 2000 (11.5 - 20.7 g/dl) (12.13).

Likewise with research by Ata AB, Mansi K, Aburjai T (2018). The results of this study are in accordance with research in Japan which stated that no significant changes were observed in serum concentrations of total cholesterol and triglycerides, but serum concentrations of HDL2 cholesterol increased significantly at 10 weeks. exercise therapy. Serum concentrations of HDL2 cholesterol increased significantly at 10 weeks, but there were no changes in total cholesterol and HDL3 (14).

Applying prolanis exercises 2 times a week in the treatment of hypertensive patients according to the criteria, namely without contraindications, patients who do not have complications, with the formula in addition to diet, medication and hypertension education. Hypertension sufferers can do this exercise independently and staff, especially nurses, have the responsibility to supervise and always motivate patients so that they can do the exercise to prevent complications of hypertension.

The results of this research can be used as a resource for students in the nursing field in the development of nursing science, especially in hypertension care, and it is necessary to carry out

research with a control group and with a larger number of respondents and not in one research location.

CONCLUSION

The results of the study showed that prolanis exercise had a significant effect on the cholesterol of Hypertension Program Patients (PPHT) at the Kotabumi II Community Health Center. Applying prolanis exercises 2 times a week in the treatment of hypertensive patients according to the criteria, namely without contraindications, patients who do not have complications, with the formula in addition to diet, medication and hypertension education. Hypertension sufferers can do this exercise independently and staff, especially nurses, have the responsibility to supervise and always motivate patients so that they can do the exercise to prevent complications of hypertension. The results of this research can be used as a resource for students in the nursing field in the development of nursing science, especially in hypertension care, and it is necessary to carry out research with a control group and with a larger number of respondents and not in one research location.

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