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The Effect of Physical Exercise On Changes The Blood Pressure of The Elderly in The Village of Narmada West Lombok

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ABSTRACT
Physical exercise is one of the most effective efforts in controlling blood pressure. High blood pressure is a problem that is still widely found in developing countries. The purpose of this study was to see the effect of physical exercise on changes the blood pressure of the elderly in the village of narmada west Lombok. The design of this study uses pre-experimental with crossectional approaches. The samples in this study were 16 people. Analyze the data using the paired t test. The results of this study showed a p-value=0.00 ($p<0.05$). There was a difference between blood pressure in the elderly before and after physical exercise.

Keywords: Blood Pressure, Elderly, Physical Exercise

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BACKGROUND

The Blood pressure is the power produced by blood in each unit area of the vascular wall, the pressure in the vessel is 100 mmHg it means that the power generated is enough to push the column of mercury against gravity up to as high as 100 mm. Blood pressure can also be defined as lateral strength in the walls of arteries driven by pressure from the heart (Annisa, Thahirah, 2017). Hypertension is a public health problem that occurs in developed and developing countries, a person is diagnosed with hypertension if his blood pressure ≥140/90 mmHg.

Hypertension generally has no specific cause. Hypertension occurs in response to increased cardiac output or increased capillary pressure. However, there are several factors that affect the occurrence of hypertension, genetic, obesity, stress, loss of tissue elasticity and artericlerosis in the elderly as well as dilation of blood vessels. The cause of hypertension in the elderly is the occurrence of changes in the elasticity of the aortic wall decreases, the heart valve thickens and becomes stiff, the ability of the heart to pump blood decreases by 1% every year after the age of 20 years the ability of the heart to pump blood decreases causing a decrease in contractions and volume, loss of elasticity of peripheral blood vessels for oxygenation and increased resistance of peripheral blood vessels, Reni Yuli Aspiani (2014).

The highest prevalence of increased blood pressure age > 18 is found in Africa by 30%. The number of hypertension in the world continues to increase every year, it is estimated that by 2025 there will be 1.5 billion people affected by hypertension. It is also estimated that every year 9.4 million people die from hypertension and complications, Depkes (2016). According to Rikesdas (2018) stated the prevalence of hypertension based on the results of measurements in the population of Indonesia amounted to 63,309,620 people, while the death rate in Indonesia amounted to 427,218 deaths. Hypertension occurs in the age group 31-44 years (31.6%), age 45-54 years (45.3%), age 55-64 years (55.2%). It is expected that by 2025 indonesia will increase. While in the province of West Nusa Tenggara as many as 358,110 people and in the west Lombok area of 0.9%.

Efforts to address and prevent adverse effects are required treatment related to hypertension. Efforts that have been made in the prevention and control of hypertension so that many people consider hypertension can only be handled with the treatment of synthetic chemical drugs only or pharmacology when it can also be handled with non-pharmacological treatment, one of the non-pharmacological treatments that is physical exercise. Where the benefits obtained from physical exercise is opening the intelligence system, maximizing the supply of oxygen to the brain, heating system, sweat system, uric acid burner, blood sugar, cholesterol, lactic acid, cristale oxalate, systyem electrolyte or ozone maker in the blood, carbohydrate conversion system, immune system and freshness of the body negativ energy / virus, as well as the system of disposal of negative energy from the body.

METHODS

The research is Pre experimental research design with a sample of 16 people. The sampling technique in this study is purposive sampling, spignomanometer and stethoscope is an instrument used to measure blood pressure before and after physical exercise. Data analysis using paired t test.

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RESULTS

Table 1. Distribution characteristics of respondents

Characteristics of Respondents	N	%
Age		
• 45-52	5	31.2%
• 53-60	11	68.8%
Total	**16**	**100%**
Sex		
• Male	6	37.5%
• Female	10	62.5%
Total	**16**	**100%**
Education		
• Not completed in primary school	4	25%
• Junior high school	4	25%
• high school	2	12.5%
• College	6	37.5%
Total	**16**	**100%**
long suffering		
• 0 years	6	37,5%
• 3-5 years	10	62,5%
Total	**16**	**100%**

Based on the table above shows is distribution of age respondents averaged 53-60 years and the largest distribution of respondents is female as many as 10 respondents (62.5%), last education is college with 6 respondents (37.5%), and long suffering of hypertension 3-5 years as much as 10 respondents (62.5%).

Table 2. blood pressure in elderly hypertension before and after physical exercise

Variabel			Mean	SD	P. Value
Blood pressure	Sistol	pretest	145.62	13.647	0.000
		posttest	96.88	8.732	
	Diastol	pretest	129.38	11.815	0.000
		posttest	88.75	8.062	
Difference BP		pretest	152.90	13.647	0.000
		posttest	135.67	11.815	0.000

Based on the table above shows Sistol Mean value before physical exercise 145.62 and after 96.88 and mean Diastol before 129.38 and after 88.75 with Std. Deviation pretest 13647 and Std. Deviation posttest 8732 with p-Value 0.000< 0.05. Ha received this shows that there is a difference between blood pressure in the elderly before and after physical exercise.

DISCUSSION

Based on the results of the study obtained that age factor is one of the causes of the occurrence of high blood pressure. Based on table 1, respondents have the age of 53-60 years as many as 11 people 68.8%, female gender as many as 10 people (62.5%), educated most is college with 6 respondents (37.5%), and long suffering from hypertension 3-5 years as much as 10 respondents (62.5%).

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Hypertension is an increase in systolic blood pressure of more than 140 mmHg and diastolic blood pressure of more than 90 mmHg on two measurements in an interval of five minutes in a state of sufficient rest or calm (Ari A. Pangestu, 2016). Blood pressure can be affected by age, gender, and education which can cause a person to experience high blood pressure and can increase or decrease in a rapid time.

Age is one of the causes that affect blood pressure. Age is associated with high blood pressure (hypertension). The older a person is, the greater the risk of hypertension (Novitaningtyas, 2014). Based on research conducted by Raihan, Erwin and Dewi (2014) the majority of respondents in their research were ≥45 years old. While in anggraini research, et al (2009) that 89.1% of people aged ≥45 years who suffer from hypertension. After the age of 45 years, there will be thickening of the arterial wall due to the buildup of collagen substances in the muscle layer so that blood vessels will gradually narrow and become stiff (Widharto, 2007). This happens because the higher the age, the arteries will lose their flexibility then become stiff and the blood at each heart rate is forced to go through narrower blood vessels than before and can lead to a rise in blood pressure (Sigarlaki, 2006).

The results of this study are in the course of Hafizh's research (2016) which states that women have a greater risk of suffering from hypertension because it is affected by estrogen levels. The hormone estrogen will decrease in levels when women enter old age (menopause) so that women become more susceptible to hypertension. According to Cortas (2008) women are protected from cardiovascular disease before menopause. Women who have not experienced menopause are protected by the hormone estrogen which plays a role in increasing HDL levels. High levels of HDL cholesterol are a protective factor in preventing the occurrence of atherosclerosis. The effects of estrogen protection are considered as an explanation of the presence of female immunity in premenopausal age.

The level of education inversely proportional to the risk of illness means that the lower the level of education of a person, the higher the risk of illness. In this case the level of education can indirectly affect blood pressure in the elderly because the level of education affects a person's lifestyle such as smoking habits, alcohol consumption, food intake, and physical activity. Physical exercise is effective enough to increase maximum heart rate capacity, stimulate muscle contractions, break down glycogen and increase tissue oxygen. This exercise can reduce plaque formation through increased fat use and increased use of glucose (Kowalski, 2010). Physical exercise that is easy to do by walking in a few tens of minutes is very useful to loosen nerve tension, restore hormonal function, and realign the neotransmiter in charge of regulating blood pressure.

Physical exercise for 20-30 minutes can be a natural alternaif to lower blood pressure for elderly people with high blood pressure, because this program can stimulate muscle contractions, increase the maximum capacity of heart rate in the body and increase oxygen in tissues, researchers chose this program because this program does not cost much, this exercise can also reduce the formation of plaque caused by fat and glucose in the body, can maintain the balance of the body. Based on the above results from a statistical test paired sample t-test for systolic and diastolic blood pressure data in elderly respondents with hypertension given physical exercise, obtained a p-value= 0.000 ($p < 0.05$) for systolic and diastolic blood pressure. There is a difference between blood pressure in the elderly before and after physical exercise for 20 minutes as much as 3 times the treatment within 1 week. Uncontrollable risk factors in hypertension such as gender, heredity, race and age. While controllable risk factors such as lack of exercise or activity, obesity, drinking coffee, smoking, sodium sensitivity, alcoholism, low potassium levels, diet, occupation, education and stress (Andria, 2013).

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Physical exercise is one type of moderate-level exercise that provides benefits: keeping muscles and joints flexible, reducing muscle stiffness, cleaning the blood by improving lung efficiency, blood circulation, lowering stress and relieving the mind, activating and rejuvenating the skin, causing normal sweating. The decrease in blood pressure in hypertension occurs because the blood vessels are dilated and there is a relaxation of blood vessels that causes a decrease in blood pressure.

The heart muscle of individuals who exercise regularly is stronger compared to individuals who rarely exercise. In individuals who regularly exercise their heart contracts less to pump blood of the same volume (Scott, 2004). Exercise can cause a decrease in heart rate, therefore regular exercise will decrease cardiac output, which leads to a decrease in blood pressure in people with hypertension (Wallace, 2013). Improved working efficiency of the heart results in a decrease in systolic blood pressure, while a decrease in peripheral resistance results in a decrease in diastolic pressure (Sherwood, 2001).

CONCLUSION

The average systolic blood pressure before being given physical exercise was 145.62 and the average diastolic blood pressure before being given physical exercise was 129.38 with SD pretest 13,647

The average systolic blood pressure after being given physical exercise was 96.88 and the average diastolic blood pressure after being given physical exercise was 88.75 and the posttest SD was 8,732.

There is a difference between blood pressure in the elderly before and after physical exercise with p- value 0.000

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