



The Influence of Hypertension Exercise on Blood Pressure in Elderly Hypertension in The Working Area Of The Kedaton Health Center in Penengahan Raya Village Bandar Lampung

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ABSTRACT

Blood pressure can increase when one is aged 45 – 55 years old. The artery walls become thick due to the collagen accumulation in the muscle layers. As a result, the blood vessels will gradually narrow and become rigid. Elderly exercise is a mild exercise. It is easy to do without burdensome, which is dedicated to the elderly. The objective of this research is to analyze the effect of the elderly exercise on the blood pressure of the hypertension elderly at Community Health Center of Kedaton.

This research used the quasi experimental method with pre and post test design. The population of research consisted of 64 respondents, 32 as the experimental group and the rest 32 as the control group. The former was exposed to the intervention of the elderly hypertension exercise. The data of research were analyzed by using T test.

There was an effect of the elderly hypertension exercise on the systolic blood pressure and diastolic blood pressure of the hypertension respondents at Community Health Center of Kedaton as indicated by the p value = 0,000. So H_0 rejected and H_1 accepted. The health workers are required to conduct socialization and training of the elderly hypertension exercise need to socialize and train the performance skill of hypertension exercise. So, they can manage the elderly whom have hypertension by using non-pharmacological management to control blood pressure on hypertension patients.

Keywords: Elderly Hypertension Exercise, Elderly Hypertension

INTRODUCTION

Hypertension is a multifactorial disease that arises because of the interaction of various factors. Increased age will cause some physiological changes, in the elderly there is an increase in peripheral resistance and sympathetic activity. Blood pressure will increase after the age of 45 - 55 years, the arterial wall will experience thickening by the collection of collagen in the muscle layer, so that the blood vessels will gradually become stiff (Setiawan, Greece & Kusyati, 2014).

The elderly are part of family and community members who are increasing in number in line with an increase in life expectancy. The number of elderly increased throughout Indonesia to 15.1 million in 2000 or 7.2% of the entire population with a life expectancy of 64.05 years. In 2006 life expectancy increased to 66.2 years and the number of elderly to 19 million people, and it is estimated that in 2020 it will be 29 million people or 11.4%. This shows that the number of elderly has increased consistently over time (Riskerdas, 2013).

The higher life expectancy, the higher the risk factors for various health problems. Common problem experienced by the elderly is the vulnerability of the physical condition of the elderly against various diseases due to reduced endurance in the face of external influences and decreased efficiency of the mechanism of homeostasis, because of this the elderly are susceptible to various diseases (Riskesdas, 2013).

LITERATURE REVIEW

According to the Lampung Provincial Health Office (2015), the highest prevalence of essential hypertension cases in Lampung Province was 30% and decreased in 2016 to 16.18% ranked the third largest disease. Most hypertension sufferers are in rural areas compared to urban areas with a prevalence of 31% vs 23.7%. This might be due to lack of awareness, public knowledge to maintain health and unhealthy life behaviors. High blood pressure is considered to increase the risk factors for coronary heart disease (CHD) because elevated blood pressure will damage the artery walls and accelerate the process of thickening (atherosclerosis) and narrowing the arteries.

Blood pressure will increase after the age of 45 - 55 years, the walls of the arteries will be deepened by the accumulation of collagen in the muscle layer, so that the blood vessels will gradually become stiff. Increased age will cause some physiological changes, in the elderly there is an increase in peripheral resistance and sympathetic activity. The regulation of blood pressure, namely reflex baroreceptors in old age, has decreased sensitivity, while the role of the kidneys has also been reduced where renal blood flow and glomerular filtration rates have decreased (Anggraini, 2009).

Classification of hypertension according to Shep (2010) is divided into two based on the cause, namely:

1. Primary hypertension, also called essential or idiopathic hypertension where the persistent increase in arterial pressure is produced by the irregularity of the normal homeostatic control mechanism. This hypertension is unknown cause and covers \pm 90% of cases of hypertension.
2. Secondary hypertension, persistent due to the second basic disorder besides essential hypertension. This cause of hypertension is known and concerns \pm 10% of cases of hypertension. Classification of hypertension based on blood pressure measurement results according to the Joint National Committee on Detection, Evaluation and Treatment of High Blood Pressure (JNC) in Smeltzer & Bare (2010) which is <130 mmHg for systolic blood pressure and <85 mmHg for diastolic blood pressure . The classification of hypertension according to JNC VII in detail can be seen in table 1.

Table 1. Classification of blood pressure in adults aged 18 years and over are not taking antihypertensive drugs and not currently ill.

Category	Systolic	Diastolic
Normal	<130 mmHg	<85 mmHg
Normal Tinggi	130-139 mmHg	85 - 89 mmHg
Stadium 1 (Ringan)	140-159 mmHg	90-99 mmHg
Stadium 2 (Sedang)	160-179 mmHg	100-109 mmHg
Stadium 3 (Berat)	180-209 mmHg	110-119 mmHg
Stadium 4 (Sangat Berat)	>210 mmHg	>120 mmHg

Source: Joint National Committee on Detection, Evaluation and Treatment of High Blood Pressure (JNC) VII in Smeltzer & Bare (2020).

According to the National Heart, Lung, and Blood Institute (2000) in Potter & Perry (2010) isolation cytolic hypertension is the most prominent form of hypertension in the elderly. Isolated systolic hypertension is where systolic pressure reaches 140 mmHg and diastolic <90 mmHg. So hypertension can also be categorized in MAP (mean Arterial Pressure). Categories of hypertension based on MAP values can be seen in the following.

Table 2. Classification of blood pressure in adults aged 18 years and over based on Mean Arterial Pressure values

Category	MAP
Normal	70-90 mmHg
Normal Tinggi	100-105 mmHg
Stadium 1 (Ringan)	106-119 mmHg
Stadium 2 (Sedang)	120-132 mmHg
Stadium 3 (Berat)	133-149 mmHg
Stadium 4 (Sangat Berat)	>150 mmHg

Source: National Heart, Lung, and Blood Institute (2000) dalam Potter & Perry (2010).

The cause of essential hypertension is not known with certainty, but the possible underlying cause must always be determined. Possible influencing factors are genetic susceptibility, excessive sympathetic nerve activity, abnormal Na or K transport membrane, excessive salt use, abnormal renin-angiotensin aldosterone system (Underwood, 2009).

The cause of hypertension is divided into two groups, namely factors that cannot be changed, namely gender, age, and genetics and factors that can be changed, namely diet, smoking, and physical activity. (Price & Wilson, 2006).

Recent studies have shown that the combination of non-pharmacotherapy and drug (pharmacotherapy) not only reduces blood pressure, but also reduces the risk of stroke and ischemic heart disease. Therapy with drugs can be done by administering antihypertensive drugs, while for therapy without drugs can be done by exercising regularly, proper exercise in this case is elderly gymnastics (Armilawati, 2007).

Elderly exercise is a mild exercise and is easy to do, not burdensome, which is applied to the elderly. Elderly exercise activities help the body to stay in shape and stay fresh because it keeps the bones strong, encourages the heart to work optimally and helps eliminate excessive free radicals in the body (Suroto, 2004). Research by Astari, et al (2011) on the effect of elderly exercise on elderly blood pressure with hypertension in the elderly exercise group in Banjarkaja Sesetan, South Denpasar, using only one group sample, blood pressure measurement was only done at the first meeting as a pretest and the sixth meeting as a post test, so it is necessary to examine the effectiveness of elderly exercise on blood pressure in elderly hypertension.

Preliminary studies that have been obtained obtained high data on the incidence of hypertension in Metro Lampung city of 9.9% (the second largest in Lampung Province) (Ministry of Health's Health Research and Development Agency, 2013). Data on visits to polyclinics in 2014 were 5,625 (54%). Hypertension is the third most common case in Lampung. Hypertension is mainly suffered by the elderly. Kedaton Bandar Lampung Health Center is in charge of several elderly Posyandu, which in the implementation of its activities have not yet realized the elderly gymnastics.

Elderly Gymnastics made by the State Minister of Youth and Sports (MENPORA) is an effort to increase the physical fitness of the elderly group which is increasing in number. This exercise activity will help the body to stay in shape and stay fresh because it keeps the bones strong, encourages the heart to work optimally and helps eliminate free radicals that roam the body. (Suroto, 2004).

Physical activities such as gymnastics in old age which are carried out routinely will increase physical fitness, so indirectly exercises can improve heart function and reduce blood pressure and reduce the risk of fat accumulation in blood vessel walls so that it will maintain its elasticity.

Stages of the elderly exercise movement include heating, conditioning, and cooling (Sumintarsih, 2006), where the stages are:

1. The heating stage
Breathing regulation
2. Core stage in place
 - 1) Clap the hands
 - 2) Clap your fingers
 - 3) Cross between fingers
 - 4) Cross the right hand thumb
 - 5) Clap between pinkies
 - 6) Clap between index fingers
 - 7) Tap left and right wrists alternately
 - 8) Knock the left hand pulse
 - 9) Press between palms and turn palms
 - 10) Open and squeeze the fingers
 - 11) Tap the backs of your right hand in turns
 - 12) Pat the backs of the arms and shoulders alternately
 - 13) Pat the waist
 - 14) Side thigh pat
 - 15) Pat your legs
 - 16) Muscle stretch
 - 17) Patting the lower abdomen
 - 18) Upright attitude of the knot to the stomach
 - 19) Toes on feet
 - 20) Perfect attitude perpendicular
3. The cooling stage
 - 1) Pull and hold the breath then exhale both hands down in front of the chest
 - 2) Pull and hold the breath then exhale to the side
 - 3) Pull, hold, and exhale.

Purpose of the study

The achieved of the objectives this study are:

1. To get the average blood pressure in the control and intervernion groups before and after doing elderly gymnastics.
2. To determine the relationship between elderly exercise on blood pressure in hypertensive elderly at the Kedaton Health Center in Bandar Lampung.

METHODS

The research design used was a Quasi Experimental Pre-post Test involving the control group and the intervention group. The study was conducted aiming to determine changes in blood pressure before and after given elderly exercise. Assessment or observations on research using this design are carried out twice, namely before and after the experiment (pre-post test). The difference between pre and post test is considered the effect of treatment (Arikunto, 2005). A description of the research design to be carried out is illustrated in the following chart:

Table 3. **Quasi Experimental Research Design Pre-Post Test Design Approach**

Group	Pre Test	Treats	Post Test
Intervensi	O.a	Senam Lansia	O1.a
Control	O.b		O1.b

Oa: BP pre-exercise group Intevention

O1a: BP post-exercise group Intervention

Ob: BP group control on first meeting

O1b: BP group control at the end of meeting

The target population in this study is the elderly with hypertension, while the affordable population in this study is the elderly with hypertension in the Kedaton Health Center area of Bandar Lampung, totaling 64 people in March-May 2019 from several elderly Posyandu.

The type of the idi study sample is probability sampling using cluster sampling techniques, namely the selection of samples refers to groups not to individuals (Dahlan, 2009). Involve elderly women who meet the inclusion criteria as follows:

1. Elderly people with hypertension
2. Elders who are able to follow gymnastics
3. Elderly in the Kedaton Health Center area
4. The elderly are not in therapeutic treatment

Minimum sample size calculation is based on the results of calculations using the difference test between the two averages with a significance level of 5%, the strength of the 95% test, and the two-sided hypothesis test is calculated based on the sample size formula (Hidayat, 2007)

The instruments used to measure blood pressure are the observation sheet and shygmanometer. Blood pressure measurements are carried out before and after the elderly are given gymnastics. Elderly gymnastics is guided by Puskesmas midwives who have been given elderly gymnastics training by the Lampung City Health Office.

RESULTS

Research conducted on 64 respondents who were divided into 32 respondents who did not do elderly gymnastics and 32 respondents who did elderly gymnastics. Data collection was carried out for 3 months. Data is collected 30 minutes before the elderly exercise and 30 minutes after the elderly exercise is done every time the elderly exercise activities carried out. The purpose of data collection in this study was to determine whether there were changes in blood pressure before and after the elderly exercise in the intervention group compared with the control group at the same time period.

Univariate Analysis of blood pressure variables before and after elderly exercise in the control group and the intervention group. Data will be presented in the form of an average table for elderly blood pressure (Hastono, 2007).

Table 4. Description of the distribution of systolic blood pressure values in the elderly who have hypertension before and after the elderly exercise in the control group.

Systolic	Mean	Median	SD	Min-maks	P-value
Pre - exercise	172	172,5	9,9	155-190	0,041
Post - exercise	169	170	10,7	150-190	

The average value of systolic blood pressure in the control group before gymnastics was 172 mmHg, and the highest systolic blood pressure was 190 mmHg. The average systolic value after exercise is 169 mmHg, and the highest systolic is 190 mmHg.

Table 5. Picture of the distribution of diastolic blood pressure values in the elderly who have hypertension before and after the elderly exercise in the control group.

Diastolik	Mean	Median	SD	Min-maks	P-value
Pre - exercise	89,38	90	7,7	80-100	0,006
Post - exercise	84,38	80	10,7	70-100	

The average value of diastolic blood pressure in the control group before gymnastics was 90 mmHg, and the highest diastolic was 100 mmHg. The average value of diastolic after gymnastics is 84.38 mmHg, and the highest diastolic is 100 mmHg.

Table 6. Description of the distribution of systolic blood pressure values in the elderly who experience hypertension before and after the elderly exercise in the intervention group.

Systolic	Mean	Median	SD	Min-maks	P-value
Pre - exercise	182,5	182,5	12,7	160-200	0
Post - exercise	130	130	7,6	120-145	

The average value of systolic blood pressure in the intervention group before exercise was 182.5 mmHg, and the highest systolic blood pressure was 200 mmHg. The average systolic value after exercise is 130 mmHg, and the highest systolic is 145 mmHg.

Table 7. Picture of the distribution of diastolic blood pressure values in the elderly who have hypertension before and after the exercise of the elderly in the intervention group.

Dyastolic	Mean	Median	SD	Min-maks	P-value
Pre - exercise	97	100	6,8	80-110	0
Post - exercise	72,81	70	6	65-90	

The average value of diastolic blood pressure in the intervention group before gymnastics was 97 mmHg, and the highest diastolic was 110 mmHg. The average value of diastolic after gymnastics is 70 mmHg, and the highest diastolic is 70 mmHg.

Bivariate Analysis to see the effect of elderly exercise on blood pressure in elderly hypertension at the Kedaton Health Center. Before the Bivariate Analysis Test, to determine the normality of data distribution, a normality test will be conducted using the Kolmogorov test. Test for normality using Kolmogorov (Sabri & Hastono, 2010). There were 64 respondents in each

group of 32 people. Data distribution is said to be normal when the Kolmogorov test results obtained $p \text{ value} \geq 0.05$. And the data is said to be not normally distributed jina $p \text{ value} < 0.05$. Bivariate analysis will be carried out twice. Analysis to determine differences in blood pressure before and after elderly exercise is done by using the dependent t test, if the data are normally distributed, and if the data are not normally distributed, will be tested with Wilcoxon analysis (Sabri & Hastono, 2010).

Table 8. Analysis of the effect of elderly exercise on systolic blood pressure in hypertensive elderly at the Kedaton Lampung Health Center.

The Average BP	Mean	Median	SD	Min-maks	P-value
Post Exercise					
BP Systole Control	170	10,7	150-190	150-190	0
BP Systole Intervention	130	7,6	120-145	120-145	

Statistical test results using the independent t test obtained a p value of 0,000, meaning that there is an influence of elderly exercise on systolic blood pressure in hypertensive elderly at the Kedaton Public Health Center in Lampung.

Table 9. Analysis of the influence of elderly exercise on diastolic blood pressure in hypertensive elderly at the Kedaton Lampung Health Center.

The Average BP	Median	SD	Min-Maks	P value
Post Exercise				
BP Dyastole Control	80	7,2	70-100	0
BP Dyastole Intervention	70	6	65-90	

Statistical test results using the independent t test obtained a p value of 0,000, meaning that there is an influence of elderly exercise on diastolic blood pressure in hypertensive elderly at the Kedaton Public Health Center in Lampung.

Table 10. Data Normality Test Results

		Systolic	Limit	Dyastolic	Limit
Group Control	Pre	0,68	Normal	0,005	Abnormal
	Post	0,284	Normal	0,003	Abnormal
Group Intervention	Pre	0,257	Normal	0,013	Abnormal
	Post	0,107	Normal	0	Abnormal

It is known that all systolic blood pressure data in both groups in both pre and post intervention conditions are normally distributed, whereas all diastolic blood pressure data in both groups both in pre and post intervention conditions are not normally distributed.

DISCUSSION

1. Description of the average value of blood pressure in the elderly who have hypertension before and after the elderly exercise in the control group. The results of elderly blood pressure measurements in tables 4 and 5 illustrate that the average of the systolic blood pressure of the control group before 172 mmHg dropped to 169 mmHg, which is moderate hypertension (stage 1). The results of diastolic blood pressure measurements in the elderly in the control group before 89.38 mmHg and thereafter dropped to 84.38 mmHg which is borderline hypertension. Hypertension experienced by respondents is influenced by a variety of good risk factors that can be controlled such as sports activities, consuming salt, obesity and stress and risk factors that cannot be controlled such as age, sex, and heredity (Harrison, Wilson and Kasper, 2005).

According to the results of the study of Henuhili, Yuliati, Rahayu, and Nurkhasanah (2011) found that the gene that causes hypertension is dominant, not recessive. Individual hypertension exists in each generation and offspring who do not inherit hypertension will have offspring who are not hypertensive as well. Inheritance of hypertension is not X-linked, that is, genes found on the sex chromosomes, because both father and mother, can inherit both male and female offspring.

The elderly can be affected by hypertension due to decreased organ function in the cardiovascular system, heart valves thicken and become stiff, and experience a decrease in elasticity of the aorta and other large arteries (Ismayadi, 2004). In addition, there is an increase in peripheral vascular resistance when the ventricles are pumping, so that systolic pressure and afterload increase (Gunawan, 2009).

Structural and functional changes in the peripheral vascular system cause changes in blood pressure to occur in old age. These changes include atherosclerosis, loss of connective tissue elasticity, and reduction in relaxation of vascular smooth muscle resulting in decreased blood vessel distention and stretching ability (Gunawan, 2009).

One factor that can lead to increased blood pressure in the elderly is due to the fact that there is a lack of physical activity such as regular exercise (Harrison, Wilson, and Kasper, 2005). Lack of physical activity exercises such as gymnastics, can also result in hypertension due to decreased cardiac output so that pumping to the heart becomes more reduced. Lack of physical activity training can cause stiffness of blood vessels so that blood flow is blocked and can cause hypertension (Giriwijoyo, 2007).

The results of this study are no different from the study of Ikafah (2014) who found that the results of blood pressure measurements every before and after gymnastics found that there was a gradual decrease in blood pressure. On the first day of exercise the average blood pressure value of the respondents did not change because it might be as an adaptation phase. Henceforth there is a gradual decline to three months of gymnastics. Although sudden exercise causes an increase in blood pressure during exercise, repetition of physical activity can reduce blood pressure during rest and an increase in subsequent exercise will be better for people with hypertension or in normal people. Hypertension is a major risk factor for coronary heart disease, the potential effect of exercise to control blood pressure is an important public health consideration.

Ikagiah's study (2014) found that as many as 15 elderly women who regularly exercise, 11 elderly experienced a decrease of about 6 mmHg for systolic and 3 mmHg for diastolic; 3 elderly experienced a decrease of only about 1.5 mmHg both systolic and diastolic, because all three elderly suffer from DM and 1 elderly who did not experience a decrease (fixed), and can occur because the elderly have cholesterol and often consume free drugs such as pain medication head containing caffeine which can increase blood pressure so that the effect of exercise does not appear in three months of exercise.

Physical training is any effort carried out to improve physical fitness and physical condition of the elderly. Physical fitness is a physical aspect of overall fitness. The purpose of physical training is to increase strength, cardiorespiratory endurance, accuracy, excellence, and flexibility. Physical fitness in the elderly is health-related fitness that is heart-lung fitness and blood circulation as well as auto strength and joint flexibility (Ikafah, 2014).

2. Description of the average value of blood pressure in the elderly who experience hypertension before and after the elderly exercise in the intervention group. Based on table 6 and table 7 it is known that the average value of systolic blood pressure before gymnastics 182.5 mmHg and down after gymnastics 130 mmHg. Whereas diastolic before gymnastics 97 mmHg becomes 72.81 mmHg. Factors that influence the occurrence of hypertension in the intervention group are due to increasing age, where in elderly people the heart will shrink a little which is much decreased is the left ventricular cavity, due to reduced activity, also experience a decrease in heart muscle cells to cause a decrease in strength heart muscle, as a person ages, maximum heart rate and other functions of the heart gradually decrease, in the elderly blood pressure will rise gradually so that it can cause hypertension in the elderly (azizah, 2011).

Viewed from the blood pressure in the intervention group showed a decrease in average systolic and diastolic blood pressure. A decrease in systolic and diastolic blood pressure in elderly patients with hypertension in the intervention group, due to elderly exercise results in a decrease in cardiac output and a decrease in total peripheral resistance, resulting in a decrease in blood pressure (Sherwood, 2005).

The results of this study are in line with the research of Setiawan, Yunai and Kusyati (2014) who found that the results of the measurement of the average diastolic blood pressure in elderly hypertension were 87 mmHg, the median was 85 mmHg and the standard deviation was 8.63. The lowest diastolic blood pressure is 74 mmHg and the highest diastolic blood pressure is 112 mmHg. According to research Gunawan (2001) regular exercise can absorb or eliminate cholesterol deposits in arteries. Sports in question are exercises to move all the joints and muscles of the body such as walking, swimming, riding a bicycle. Not recommended to do stressful sports such as boxing, wrestling, or weight lifting, because heavy exercise can cause hypertension.

3. Analysis of the influence of elderly exercise on blood pressure in elderly hypertension at the Kedaton Health Center in Bandar Lampung. Based on table 8 and table 9, the results of statistical tests using the independent t test show the influence of elderly exercise on blood pressure in elderly hypertension.

According to Veronique and Robert (2005) concluded that exercise can be applied as a management of hypertension not only for prevention, but can also maintain the health of the elderly. This study is in line with research conducted by Astari (2012) which concluded that there is a significant influence between elderly exercise with a decrease in blood pressure in elderly hypertension. Elderly exercise that is done repeatedly (high frequency), then gradually decreasing blood pressure will last long. That is the reason that Lathan's physical exercise activities carried out regularly can reduce blood pressure. Type of exercise that is effective in lowering blood pressure is elderly exercise with moderate intensity. The frequency of exercise 3-5 times a week with 20 to 60 minutes long exercise (Rigud, 2006).

Exercise has an influence on the cardiovascular system (blood circulation) to improve its ability. More blood vessels (small blood vessels) are formed in active tissue to improve food and oxygen supply, and exercise burns off excess fat in the system and inhibits the fat content in the vessels, thereby reducing the risk of thrombosis (Hardjana, 2000).

Exercise has also been known to increase High Density Lipoprotein (HDL), which in turn helps the process of metabolism and reduces levels of Low Density Lipoprotein (LDL) (Smeltzer & Bare, 2010). Elderly exercise consisting of warm-up exercises, core exercises, and cooling exercises in which movements also aim to reduce anxiety, stress, and reduce levels of depression. This decrease will stimulate the work of the peripheral syarag system (autonomic nervous system), especially parasympathetic which causes vasodilation of blood vessel cross section will result in a decrease in both systolic and diastolic blood pressure (Hardjana, 2008).

This study is also in line with research conducted by Devi (2012) which states that there is an influence of yoga practice on decreasing systolic and diastolic blood pressure in the elderly. Research conducted by Sukartini (2010) on the benefits of exercise on elderly fitness results showed that exercise could affect not only pulse stability, but also blood pressure, respiration and immunoglobulin levels, with the results of statistical analysis tests for the systolic blood pressure p-value category 0.02 means a $<p = 0.05$) means that there are differences in blood pressure between the elderly in the treatment and control groups.

The results of this study are in line with the research of Setiawan, Greece & Kusyati (2014) who found that the frequency of elderly exercise on pulse shows a moderate relationship ($r = -0,394$) and has a negative pattern which means the higher the frequency of elderly exercise, the lower the pulse rate. Statistical test results found that there is a significant relationship between the frequency of elderly gymnastics with pulse (p value = 0.026). The results showed there is a relationship between the frequency of elderly exercise with the pulse in the elderly. Elderly exercise is a mild and easy to do exercise, not burdensome, which is applied to the elderly. The activity of elderly gymnastics helps the body to stay in shape and stay fresh because it keeps the bones strong, encourages the heart to work optimally and helps eliminate excessive free radicals in the body (Suroto, 2004). The results of this study are in line with research conducted by Tintin (2006) which mentions the effect of exercise exercises on improving fitness as indicated by a decrease in resting pulse.

Conclusion

1. The average value of systolic blood pressure in the control group before gymnastics is 172 mmHg and after gymnastics 169 mmHg. The average value of diastolic blood pressure in the control group before gymnastics was 89.38 mmHg, and after gymnastics 84.38 mmHg.
2. The average value of systolic blood pressure in the intervention group before gymnastics was 182.5 mmHg and after gymnastics 130 mmHg. The average value of diastolic blood pressure in the intervention group before gymnastics was 97 mmHg, and after gymnastics 72.81 mmHg.

3. There is an influence of elderly exercise on systolic and diastolic blood pressure in elderly hypertension at the Kedaton Health Center in Bandar Lampung. (p-value 0,000).

Recommendation

For Kedaton Health Center, health workers need to conduct socialization and skills training for elderly gymnastics so that they can carry out the management of elderly people with hypertension by means of non-pharmacological management to control blood pressure in hypertensive patients.

For community, elderly exercise therapy can be taken into consideration for the elderly and people suffering from hypertension. Considering the benefits of elderly exercise that can be used to control blood pressure, then this can be used as an alternative to controlling blood pressure.

For Educational Institutions, can make the results of this study as a reference for nursing management of hypertension and can be developed as a competency that must be mastered by students.

For further researchers, further research on the influence of elderly exercise on blood pressure in elderly people with hypertension can be done by monitoring the factors that influence blood pressure, such as controlling diet, smoking, and stress, as well as screening for patients with essential hypertension appropriately.

For researchers, further and continuous research so that the results of this study can be used in providing nursing care for elderly patients who have hypertension by giving hypertension elderly exercise by providing elderly exercise to control blood pressure.

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