

The Effectiveness of Tera Exercises, Healthy Heart Exercises and Elderly Exercises to Decrease Blood Pressure for Elderly

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Abstract

Indonesian life expectancy has increased, and the number of elderly people is also getting bigger. This study aims to determine the effectiveness of tera exercises, healthy heart exercises, and elderly exercises on lowering blood pressure for 28 elderly, these exercises are done for 20 minutes. The elderly has an age of 60-90 years. The type and research design used in this study was a Quasi Experiment with pre-test and post-test design which has a level of $p < 0.00$. This study was conducted on elderly women with a standard deviation of 133.85/85.56. All of the elderly before being given the tera exercise treatment were recorded to have an average systolic blood pressure of 145.96 ± 9.2 , on healthy heart exercise 141.82 ± 11.6 and elderly exercise 138.5 ± 17.6 . Then measure blood pressure after doing exercise, on tera exercise it was 133.96 ± 8 , while on healthy heart exercise it was 128.39 ± 14 , and the average on elderly exercise was 139.18 ± 8.6 . Based on the result of the multiple linear regression test has a value of $p < 0.00$. This means that giving exercise has a significant effect on reducing blood pressure in the elderly. The decrease of blood pressure on tera exercises has a value of 70%, in healthy heart exercises has a value of 90%, and in the elderly exercises has a value of 85%. Conclusion all of these exercises have significant values in reduced blood pressure for the elderly. The healthy heart exercise most significant influence in reduced blood pressure for the elderly.

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INTRODUCTION

Indonesian life expectancy has increased, besides that, the number of elderly people is also getting bigger. *World Health Organization* (WHO) calculated that the elderly population in Indonesia in 2020 reached 11.34% or recorded 28.8 million people. In 2025 the number of elderly citizens in Indonesia will increase by 41.4%. It is estimated that Indonesia is included in the category of the country with the largest elderly population in the world. Indonesia is expected to experience an *aged population boom* in the first two decades of this 21st century, therefore, it needs to be anticipated because it will have a broad impact on family, society, and country. The elderly need to get better attention in the national development (Kementrian Kesehatan RI, 2016).

The elderly is someone who has entered the age of over 60 years. Elderly is an age stage in humans who have entered the final stages of the phase of life. The elderly will experience a process called the Aging Process (World Health Organization, 2016).

Old age is the final stage of development in the human life cycle. In the elderly, there is a decrease in the anatomy and function of the organs. Decreased function of blood vessels can lead to hypertension (Ifansyah, M. N., Herawati., & Diani, N, 2015). This process is characterized by the gradual loss of tissue in the nervous system, muscles, and other tissues so that the body dies little by little (Andria, K. M. 2013).

In Indonesia, there is a change in disease patterns from infectious diseases until non-communicable diseases, which is known as the *epidemiological transition*. Non-communicable diseases (NCDs) are the most common cause of death in Indonesia, where infectious diseases are still an important problem and at the same time, the morbidity and mortality of NCDs are increasing. Indonesia must bear the double burden of handling health and the challenges that must be faced in the development of the health sector, for example, Diabetes Mellitus, heart disease including cardiovascular, chronic

lung disease, stroke, and cancer (Badan Pusat Statistik RI, 2019).

Increased blood pressure in the elderly is also an effect of the aging process which causes changes and decreases in function of the cardiovascular system. Such as heart valves will thicken and become stiff, lose elasticity of blood vessels, and increase peripheral vascular resistance so that blood pressure increases (Mubarak, 2006).

The high incidence of hypertension in the elderly demands the role of health workers to carry out prevention and health promotion efforts. Several prevention ways can be done by the elderly to avoid hypertension with the motto SEHAT, there are Seimbangkan gizi (balance nutrition), Enyahkan rokok (get rid of cigarettes), Hindari stress (Avoid stress), Awasi tekanan darah (monitor blood pressure), and Teratur berolahraga (do regular exercise). Regular exercise can be done by physical exercises that are suitable for the elderly, these include walking, cycling, swimming, doing homework, and exercises (Wahyuningsih & Astuti, E. 2007).

The increase in the number of elderly people needs special attention, especially improving their quality of life. One of the government's efforts for elderly health is the existence of elderly exercises which is carried out at the elderly posyandu. Elderly exercise that is carried out regularly can improve musculoskeletal fitness which is associated with improving health status generally, reducing the risk of chronic disease and disability (Agustina, D., Rival, A., & Kurniawati, N. 2016). The presence of genetic factors in certain families will affect families who are at risk of hypertension (Agustina & Raharjo, 2015).

Most people aged over 60 years often experience hypertension, for those who have hypertension, the risk of stroke and other cardiovascular diseases will increase if not handled properly (Anggara and Prayitno, 2013). Problems experienced by the elderly are described with the theme of physical problems and psychosocial problems. The support received is described by the theme of the source

of support and the type of support. The meaning of support is described with the theme of inner pleasure (Jafar, N., Wiarsih, W., & Permatasari. 2011).

The elderly have a high risk of degenerative diseases. Hypertension occupies the largest proportion of all reported degenerative diseases. Tera exercises and healthy exercises are some of the non-pharmacological efforts to suppress hypertension (Ambardini, R. L. 2008).

With decreased metabolism in the elderly, they are at risk of hypertension and many more. By doing sports, the elderly can restore the decrease in metabolism. Several sports are recommended for the elderly, one of them is exercises. Exercises for the elderly has adjusted its movements which are specifically intended for the elderly. Many exercises are intended for the elderly and each has been used for their health, one of which is lowering blood pressure. With this background, the researcher is interested in observing the effectiveness of tera exercises, healthy heart exercises, and elderly exercises in lowering blood pressure for the elderly.

METHOD

The type and research design used in this study was a *pretest-posttest* design with a *Quasi-Experimental* research approach that uses quantitative data to emphasize its analysis on numerical data which are processed by statistical methods.

The data collection method in this study was to measure the blood pressure of 20 women elderly with an average age of 73,54±15. This was because at the age of menopause, women are more susceptible to hypertension (Potter & Perry, 1997). After they were given tera exercise treatment, healthy heart exercise, and elderly exercise, then the measurements were taken to find the most effective effect of the three exercises which was more effective in lowering blood pressure in the elderly with hypertension. Data collection was carried out before and after treatment:

Each exercise is carried out for 20 minutes of the duration, and each exercise is done on a different day. The test used in this study was the measurement of blood pressure in the elderly after and before doing tera exercise, healthy heart exercise, and elderly exercise. This study aims to determine the difference between before and after being given treatment from tera exercise, healthy heart exercise, and elderly exercise to find out which is more effective for lowering blood pressure in hypertensive elderly. The tools used in this research are a sphygmomanometer, speaker, LCD projector, and laptop.

Multiple regression is a linear relationship between two or more independent variables ($x_1, x_2, x_3, \dots, x_n$) and the dependent variable (Y). Regression analysis is used to measure the strength of the linear association (relationship) between two or more variables. The design of the regression test is intended to test how the influence of the variable X (x_1 tera exercises, x_2 healthy heart exercises, x_3 elderly exercises) on the Y variable (blood pressure drop).

RESULTS AND DISCUSSION

The results of the normality test and multiple linear regression test can be seen in the table 1 and table 2 below:

Table 1. Sample characteristics (n=28)

Blood Pressure	Exercise			
	Tera	Healthy Heart	Elderly	
Sistole	Pretest	145.96±9.2	141.82 ±11.6	138.5 ±17.6
	Posttest	133.96±8	128.39 ±14	139.18 ±8.6
Distole	Pretest	133.96±10	128.39 ±14	139.18 ±9.4
	Posttest	86.39 ±5.4	83.46 ±7.5	86.82 ±4.7

In the normality test using the Kolmogorov test the data yields a value of 0.10, in other words, the data is normally distributed. Hypothesis Test of Multiple Linear Regression

sig $p > 0.05$ means the data was normally distributed. In the multiple linear regression test, there was a significance value of 0,00 where $0,00 < p < 0,05$. F test showed that the results of blood pressure measurements simultaneously decreased after being given treatment with tera exercise, healthy heart exercise, and elderly exercise. This shows that exercise is very important for the elderly to reduce the risk of hypertension.

Table 2. Termination Coefficient Test

Exercises	Partial	Percentage
Tera	0.837	70
Healthy Heart	0.947	90
Lansia	0.924	85

From the table of the determination coefficient in the partial table, it is noted that the tera exercise had a value of 0.837, and healthy heart exercise had a value of 0.947, while a value of elderly exercise was 0.924. In other words, the results showed that the results of tera exercise with 28 elderly women as respondents had a 70% reduction in blood pressure, 90% healthy heart exercise, and 85% elderly exercise.

One of the physical activities that can be done and recommended for the elderly is exercises (Rahman, M. S., and Salek, A. 2009). Healthy heart exercises is useful in lowering blood pressure. Healthy heart exercises is a sport that has a goal to nourish the heart (Ginting, S. U. 2011). Physical activity such as exercise is one of the most dominant factors affecting hypertension in the elderly (Wahyuningsih & Astuti, 2007). Atherosclerotic brain arteries can become weak, which can increase the chance of an aneurysm forming (Amran, Y., Febrianti., & Irawanti, L. 2010). If people do exercise, blood circulation will be smooth, it can lower blood pressure (Herwati & Sartika, W. 2013).

According to the analysis of researchers, hypertension in the elderly occurs due to the aging process in them, there is a physiological decline that causes the power of the heart's pumping machine to decrease. Besides that, Large arteries lose their flexibility so they become stiff and cannot expand when the heart

pumps blood through them, which can raise blood pressure. The influence of elderly exercise on decreasing blood pressure of those who suffer from hypertension is caused by activities that stimulate an increase in the strength of the heart pump, besides that, it stimulates vasodilation of blood vessels so that blood flow becomes smooth and there is a decrease in blood pressure.

This analysis is in accordance with the theory put forward by (Ambardini, R. L. 2008) which stated that the power of the heart pumping machine decreases in old age. Various types of important blood vessels in the heart, and brain stiffening occur. Physical exercise such as Tera Exercises and Healthy Exercises is one of the non-pharmacological efforts to suppress hypertension. If it is done regularly, it will have a good impact on the elderly on their blood pressure. With regular and continuous physical exercise or exercises for the elderly, the heart valves that were previously experiencing sclerosis and thickening gradually return to basic or normal conditions. Besides that, Myocardial stiffness no longer occurs, there is a contraction of the heart muscle, stroke volume, and cardiac output are no longer increasing. This will give the effect in blood pressure no longer increasing or decreasing.

Prevention efforts that can be done for people with hypertension so that the disease does not become severe, of course, must be accompanied by the use of drugs prescribed by a doctor. Prevention carried out by collaboration between doctors and daily lifestyles will achieve significant results (Carter et al., 2009). In order to avoid fatal complications of hypertension, good preventive measures must be taken, including by avoiding risk factors for hypertension.

CONCLUSION

The effectiveness of tera exercise, healthy heart exercise, and elderly exercise on reduced blood pressure in the elderly, conclusions: there is a simultaneous significant effect between tera exercise, healthy heart exercise, and elderly exercise to decreased blood pressure in the

elderly. There are significant effect between each tera exercise, healthy heart exercise, and elderly exercise on reducing blood pressure in the elderly. The healthy heart exercise most significant influence in reduced blood pressure for the elderly than Tera dan Elderly exercises.

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