THE EFFECT OF ERGONOMIC GYMNASTICS ON HYPERTENSION RISK OF ELDERLY COMMUNITIES

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Abstrak
Penelitian ini bertujuan untuk menyelidiki apakah senam ergonomis berdampak pada nilai tekanan darah lansia penderita hipertensi. Desain penelitian pra eksperimen digunakan dalam jenis penelitian kuantitatif ini. Pengambilan data dilakukan secara offline untuk responden dengan menggunakan sphygmomanometer dan lembar observasi. Uji Wilcoxon digunakan untuk analisis data. Hasil penelitian menunjukkan bahwa rata-rata selisih sistolik sebelum dan sesudah senam ergonomis adalah 20,96 mmHg, dan rata-rata selisih diastolik sebelum dan sesudah senam ergonomis adalah 14,56 mmHg. Hasil intervensi senam ergonomis dapat terlihat pada perubahan pengukuran tekanan darah sistolik dan diastolik. Setelah dilakukan analisis statistik didapatkan nilai p untuk tekanan darah sistolik sebesar 0,000 dengan jumlah responden sebanyak 25 orang. Artinya $p < \alpha$ (0,000 < 0,05) menunjukkan bahwa Ho ditolak dan Ha disetujui. Dapat disimpulkan bahwa senam ergonomis berpengaruh besar terhadap nilai tekanan darah lansia yang mengalami tekanan darah tinggi (hipertensi).
Kata kunci: Hipertensi, Lansia, Senam Ergonomik, Tekanan Darah

Abstract
This research looked to investigate if ergonomic exercise had any impact on the blood pressure values of elderly people with hypertension. Pre-experimental research design is used in this quantitative study type. Data collection was carried out offline for respondents using a sphygmomanometer and observation sheets. The Wilcoxon test was employed for data analysis. The findings revealed that the average difference in systole before and after ergonomic exercise was 20.96 mmHg, and the average difference in diastole before and after ergonomic exercise was 14.56 mmHg. The results of ergonomic exercise interventions can be evident in the changes in systolic and diastolic blood pressure measurements. After conducting the statistical analysis, it was discovered that the p value for systolic blood pressure was 0.000 with 25 respondents. This means that $p < \alpha$ (0.000 < 0.05) indicates that Ho is rejected and Ha is approved. It may be concluded that ergonomic exercise has a substantial effect on the blood pressure values of elderly who have high blood pressure (hypertension).
Keywords: Hypertension, Elderly, Ergonomics, Blood Pressure

INTRODUCTION

Hypertension, often known as high blood pressure, is defined as an increase in systolic blood pressure above ≥ 140 mmHg and diastolic blood pressure above ≥ 90 mmHg. It can be said to be high blood pressure if it is measured twice with the result of systolic pressure ≥ 140 mmHg and diastolic ≥ 90 mmHg and measured by a five-minute measurement interval in a calm condition with adequate rest (Ministry of Health, 2013). In Indonesia, hypertension is still the biggest challenge in its management. Hypertension is often found in primary care. One of the main health issues is hypertension, which has a prevalence in Indonesia of 34.1%, up from a prevalence of 25.8% in 2013. Only around one-third of the population in Indonesia has been or has not yet been diagnosed with hypertension (Ministry of Health, 2019). In Indonesia, in 2013, it was shown that as many as 25.8% of people were diagnosed with hypertension using individual analysis. At this time, around 252,124,458 people live in Indonesia, meaning that as many as 65,048,110 people suffer from hypertension, or high blood pressure. Hypertension in Indonesia has increased to 34.1%. Hypertension has several risk factors, namely age, gender, hereditary history, genetics (genetics is a risk factor for hypertension that cannot be controlled), smoking habits, excessive salt consumption, excessive consumption of saturated fat, use of used cooking oil, consumption of alcoholic beverages, excess weight, lack of exercise, stress, and use of estrogen.

One of the risk factors that has been mentioned is age. When the age increases, the higher the possibility of people experiencing physical problems, not only mental, spiritual, economic, and social problems. Problems that are very common in old age are due to degenerative processes. Based on Riskesdas data in 2013, PTM (non-communicable illnesses), specifically hypertension or high blood

pressure, were the disorders that the elderly encountered the most frequently. Indonesia is currently experiencing a population aging phase. An aging population is one that has both an increase in the proportion of the old and an increase in life expectancy. Our nation, Indonesia, is currently seeing an overall growth in the number of aged people, from 18,000,000 elderly (7.56%) in 2010 to 25,900,000 persons (9.7%) in 2019. A 48.2 million person increase (15.77%) is anticipated by 2035 (Ministry of Health, 2019).

Hypertension in Indonesia is increasing due to various reasons. Hypertension is grouped into two causes: the first is idiopathic hypertension, also known as primary or essential hypertension with no known etiology, which is linked to a variety of lifestyle factors including nutrition and inactivity (Dewi et al., 2019). Approximately 90% of those with hypertension belong to the primary hypertension group (Ministry of Health, 2019). Secondary hypertension, also known as non-essential hypertension, affects around 5–10% of people with hypertension and has a known cause. Kidney failure is the cause. Hormonal imbalances or the use of specific medicines, such as birth control pills, account for about 1-2% of cases, while based on the form of hypertension, it is divided into three categories: diastolic hypertension, mixed hypertension (raised systolic and diastolic), and isolated systolic hypertension (Darmawan et al., 2020). Hypertension can be treated with management, which can be done by taking drugs or by modifying a lifestyle. One of them is exercising (physical activity). Patients with hypertension can modify their lifestyle by getting used to exercising, and sufferers are advised to exercise 3-5 times per week (Ministry of Health, 2013).

Exercise is one way to improve body health and increase immunity (Fabiani & Tan, 2021). Regular exercise has the added benefit of regular exercise at the right frequency, not only for treating hypertension, which is one of the main comorbidities in COVID-19 cases, but also for increasing body immunity (Fabiani et al., 2012). Many studies have proven that exercise can improve immune function (Haryati & Krisranti, 2020). The mechanism by which exercise can lower blood pressure is still not clearly understood; the cause could be due to decreased sympathetic vasoconstrictive response and decreased catecholamine segregation, increased insulin sensitivity, anti-inflammatory effects, and adaptation of blood vessel structures in individuals who do regular physical exercise (Husdarta et al., 2017). Ergonomic exercise is one way that can be done to increase immunity and reduce hypertension. Ergonomic gymnastics, also known as primaraga core gymnastics, is an exercise that can help improve body position and the elasticity of blood vessels and can also make oxygen-rich blood flow to the brain (Saputra, 2019).

Previous research, such as the research carried out by previous researcher, shows how ergonomic training can lower blood pressure in older people with a history of hypertension. Another study regarding the effectiveness of ergonomic exercises in the elderly conducted by previous researcher obtained a p value of $0.000 < 0.05$. Overall, a series of ergonomic exercises can relax the blood vessels so that they become elastic and a smoother blood flow occurs, which can affect the decrease in blood pressure in the elderly.

Because the motions used in ergonomic gymnastics are a series of movements used by humans from the past to the present, they are incredibly effective, efficient, and logical. Because the movements are tailored to the principles of body formation inspired by prayer motions, there are no exercises that are as flawless as ergonomic gymnastic actions. In other words, exercise can instantly open, cleanse, and activate all body systems, including the reproductive, cardiovascular, and urinary systems (Syahfitri et al., 2015). Movement in ergonomics consists of several basic movements, with a total of five movements. This movement has excellent benefits for preventing disease and improving health care (Wratsongko, 2020). If these movements are done regularly, with a frequency of three times a week, they can increase immunity. Every human being has a different immune system. Ergonomic exercises can prevent various diseases.

METHOD

This research uses a pre-experimental method. The goal of this study is to determine whether there is a relationship between the variables. This study's pre-post test design was one-group. The elderly with hypertension who participated in this study made up the population. In this study, a total sampling of 25 people was used. In this study, using the first instrument for the independent variable, the researcher used music and SOP for ergonomic exercises, and for the dependent variable, the researcher used a sphygmomanometer to measure the respondent's blood pressure and documented it on the

observation sheet. Data processing consists of several stages, which include editing, coding, tabulating, data entry, and data cleaning. analysis of the research data using univariate and bivariate analyses. The statistical test used is Wilcoxon, and its processing uses the SPSS. Before carrying out the Wilcoxon test by conducting a paired normality test first, if the data obtained is not normal, then the Wilcoxon test is the right analysis to use.

RESULTS AND DISCUSSION

The majority of the respondents in this study were aged 60–69 years who were included in the young elderly category, namely 23 people (92%) of the 25 respondents who had hypertension. This study was dominated by female respondents, namely 16 people (64%) of a total of 25 respondents who had hypertension. This is due to hormonal factors in women who have experienced menopause, so the prevalence of hypertension in women increases. The majority of respondents with education, namely high school graduates, were mostly high school educated; as many as 12 people (48%) of the total respondents had hypertension. This states that the elderly with a high school educational background experience hypertension. This study had as many as 3 respondents with a history of diabetes mellitus (12%). Diabetics experience increased glucose levels due to damage to the endothelial lining. High levels of fatty acids in the blood can cause endothelial cell permeability to increase so that fat-containing molecules enter the arteries. Damage to the endothelial cells results in an immune reaction and inflation, resulting in platelet deposition, macrophage tissue fibrosis, and proliferation of smooth muscle cells in blood vessels, which are the beginning of atherosclerotic lesions in blood vessels.

Systolic difference between pre and post ergonomic exercise was on average 20.96 mmHg, while diastolic difference between pre and post ergonomic exercise was on average 14.56 mmHg. Systolic and diastolic blood pressure levels can be found to have changed as a result of the ergonomic exercise intervention. Systolic blood pressure decreased on average by 25.14 mmHg and diastolic blood pressure decreased on average by 19.43 mmHg in older patients who took medication. Systolic blood pressure decreased on average by 19.33 mmHg, while diastolic blood pressure decreased on average by 12.67 mmHg. Wilcoxon analysis was utilized in the study, with a significance level of 0.05. Following the statistical test, it was discovered that the p value of systolic blood pressure was 0.000 with a sample size of 25 people, indicating that $p < \alpha$ ($0.000 < 0.05$) means that Ho is rejected and Ha is accepted, and the p value of diastolic blood pressure was 0.000 with a sample size of 25 people, indicating that $p < \alpha$ ($0.000 < 0.05$) means that Ho is rejected and Ha is accepted, indicating that there is a significant effect of ergonom.

The research conducted showed that ergonomic exercises performed by the subjects of this study, namely the elderly, totaling 25 people with an age range of 60–79 years, contributed significantly to lowering blood pressure in the elderly. The results of the analysis carried out illustrate that there is a significant effect. After the statistical test, it was discovered that the p value for systolic blood pressure is 0.000 with a total of 25 respondents, so $p < \alpha$ ($0.000 < 0.05$) and the p value for diastolic blood pressure is 0.000 with a total of 25 individuals, so $p < \alpha$ ($0.000 < 0.05$) indicates that the relevant effect of ergonomic exercise on the blood pressure value of elderly people who have hypertension. After doing ergonomic exercises, which can cause the release of endorphins, which make the body more relaxed and can reduce feelings of stress, this decrease will work on the parasympathetic system, which makes vasodilation or dilation of blood vessels, so that there is a more controlled decrease in systolic blood pressure. This demonstrates how ergonomic workouts can lower blood pressure in elderly hypertensive patients by widening blood vessels, which improves and smooths blood flow. Systolic pressure was on average different between before and after the ergonomic exercise by 20.96 mmHg, while diastolic pressure was on average different between before and after the ergonomic exercise by 14.56 mmHg. Systolic and diastolic blood pressure levels can be found to have changed as a result of the ergonomic exercise intervention.

According to the study, elderly patients who took medicine experienced an average decrease in systole of 25.14 mmHg and an average decrease in diastolic pressure of 19.43 mmHg. The average systolic blood pressure dropped by 19.33 mmHg, and the average diastolic blood pressure dropped by 12.67 mmHg. According to the aforementioned statement, ergonomic exercise can lower blood pressure in both systolic and diastolic values; however, the reduction in blood pressure will be noticeably better if taken in conjunction with hypertension medication. In the results of this study, the decrease in blood pressure values in the elderly who take hypertension medication is greater than that in those who do not

taking hypertension medication. This ergonomic exercise is carried out three times a week in accordance with the recommendation that regular exercise frequency has a positive impact on the body. Exercise that can be said to be regular or routine is related to frequency, which is said to be regular if exercise is done 3 to 5 times a week. The elderly's quality of life can be greatly improved by exercise. Ergonomic gymnastics is a series of gymnastic movements that combine muscle movements and breathing methods. The breathing method, which is carried out together with ergonomic exercise movements, can make blood flow to the heart smoother and increase oxygen supply to the lungs. Increased blood flow throughout the body will provide sufficient oxygen-rich blood throughout the body and brain. The flow of oxygen-rich blood to the brain can increase serotonin stimulation, which makes the whole body relaxed.

The results of this study also demonstrated a reduction in blood pressure; the average difference between systolic and diastolic values before and after ergonomic exercise was 20.96 mmHg, and the average difference between these values after ergonomic exercise was 14.56 mmHg. The combination of muscle movement exercises and controlled breathing exercises can stimulate the activation of the parasympathetic autonomic nervous system's rape nuclei, which are located at the bottom of the pons and medulla. Sympathetic nervous system activation can be a hindrance to the sympathetic nervous system. These conditions will cause cardiac output and peripheral vascular resistance to decrease, resulting in vasodilation, and decreased cardiac output can cause decreased blood pressure. As a non-pharmacological remedy, this ergonomic exercise has the potential to lower blood pressure in the elderly. This effort can reduce blood pressure or reduce the dependence of hypertensive patients on the use of drugs as therapy. This ergonomic exercise is easy to do because it comes from prayer movements and doesn't require any money. If done routinely and while maintaining a healthy lifestyle, it can be maximized to control blood pressure within normal limits.

CONCLUSION

The blood pressure value of the elderly before doing ergonomic exercises is an average systolic blood pressure value of 151.76 mmHg and 94.56 mmHg diastolic blood pressure. After doing ergonomic exercises, the average systolic pressure was 130.80 mmHg and the diastolic pressure was 80.00 mmHg. Elderly people who had performed ergonomic exercises had blood pressure readings of 56% and 80%, respectively, with systolic pressure values of less than 140 mmHg and 90 mmHg, respectively. Ergonomic exercise can lower older patients' systolic and diastolic blood pressure by a combined 20.96 and 14.56 mmHg. With a p value of systolic = 0.000 and diastolic = 0.000, ergonomic exercise, an experimental treatment, had an impact on blood pressure in elderly adults with hypertension. In dealing with hypertension, ergonomic exercises can reduce blood pressure, which can be done routinely and independently.

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