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by Yurike Septianingrum

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Original Research Article

THE ERGONOMIC GYMNASTIC ON BLOOD PRESSURE AMONG ELDERLY

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Abstract

Background: Pre elderly and elderly experience uncontrolled hypertension due to disobedience to diet and not regularly taking medication (Padila, 2013). Uncontrolled hypertension can cause stroke, heart trouble, coronary heart disease and death (Laily, 2017). One of the non-pharmacological therapies to reduce blood pressure elderly with hypertension is ergonomic gymnastic (Wratsongko, 2010).

Objectives: The purpose of this study was to analyze the effect of ergonomic gymnastic on blood pressure among elderly.

Methods: This study was pre-experimental with one-group pre-posttest design approaches. Population in this study were all elderly in Suko Village who matched the inclusion and exclusion criteria as many as 25 people. The sample of this study were 23 respondents and were taken by simple random sampling technique. Respondents were given ergonomic exercises for twice a week with a duration of 30 minutes. Blood pressure measurement data were taken using a sphygmomanometer and a stethoscope. Wilcoxon sign rank test with significance value less than .05 were used to analyzed data.

Results: The results of the study there were significant differences between before and after doing ergonomic gymnastic with p value = 0.00, meaning that there was an influence of ergonomic gymnastics on blood pressure among elderly in Suko Village.

Conclusion: The Ergonomic gymnastic can reduce blood pressure among elderly in Suko Village. The role of nurses is needed as a provider of geriatric nursing care, especially in hypertension geriatric

Keywords: Hypertension, Ergonomic Gymnastic, Elderly, Blood Pressure.

INTRODUCTION

The aging process raises a variety of problems namely a decrease in physical ability that makes the elderly and elderly vulnerable to disease, especially degenerative diseases. One of the degenerative diseases experienced by the elderly and elderly is hypertension (Padila,

2013). Uncontrolled hypertension will cause stroke, heart trouble, coronary heart disease and death (Laily, 2017). One way to control hypertension in the elderly and elderly who experience hypertension is by physical exercise (Once, 2011). The type of physical exercise that is recommended for the elderly and the elderly

is ergonomic gymnastic. This exercise can help restore the position and flexibility of the nervous system and blood flow, maximize blood flow into the brain and various other benefits. Ergonomic gymnastics can reduce vasoconstriction and blood vessel pressure, besides this exercise can also improve the function of vasodilation which can reduce peripheral vascular resistance. If the elasticity of blood vessels increases, it will make it easier for blood vessels to relax quickly as the heart pumps blood (Wratsongko, 2010).

Based on data from the World Health Organization (WHO) in 2015 showed around 1.13 billion people in the world have hypertension, meaning that 1 in 3 people in the world are diagnosed with hypertension. The number of people with hypertension continues to increase every year, it is estimated that in 2025 there will be 1.5 billion people affected by hypertension, and it is estimated that every year 10.44 million people die from hypertension and its complications. The estimated number of hypertension cases in Indonesia is 63,309,620 people, while the death rate in Indonesia due to hypertension is 427,218 deaths. (Riskesdas 2018). Hypertension in East Java Province, amounting to 20.43% or around 1,828,669 population, with a proportion of men at 20.83% (825,412 residents) and women at 20.11% (1,003,257 residents) (East Java Health Office, 2017). Based on preliminary data collection at the Elderly integrated health center of Suko village in October 2019, it was found that out of 31 elderly people there were 25 (80%) elderly people suffering from hypertension.

Hypertension can cause the supply of oxygen and nutrients carried by the blood to the body's tissues that need to be inhibited (Khasanah, 2012). Hypertension has symptoms such as dizziness, headaches, feeling like pins, tinnitus (ringing in the ears) and vision blurred. Hypertension can be caused by controlled and uncontrolled factors. Controlled factors include obesity, excessive salt consumption, smoking, alcohol consumption and stress, while uncontrolled factors are heredity, gender, and age (Suiraoaka, 2012). While ergonomic

gymnastics consist of 6 movements, namely perfect standing movements, graceful movements, submissive gestures, mighty seated movements, burning seated movements and submissive reclining movements. In these movements that can reduce blood pressure is the mighty sitting movement, because in this movement can make the chest muscles and ribs become stronger, so that the chest cavity becomes larger and the lungs develop properly so that it can inhale more oxygen and increase blood flow to the body over the body, especially the head, eyes, ears, nose and lungs (Wratsongko, 2015).

Some ways to control blood pressure in hypertensive patients include reducing salt consumption, reducing alcohol consumption, reducing excess body weight, reducing cigarette consumption and doing physical activities such as sports. Activities such as sports have the benefit of lowering blood pressure if done routinely. One type of exercise that can be done as a nonpharmacologic therapy for hypertension is ergonomic gymnastic. (Wratsongko, M. 2010). Ergonomic gymnastics is one of the gymnastic techniques that has an inspired movement of prayer movements and is in accordance with the rules of the creation of the body so that these exercises are logical and efficient to do. This exercise can help restore the position and flexibility of the nervous system and blood flow, maximize blood flow into the brain and various other benefits. Ergonomic gymnastics can reduce vasoconstriction and blood vessel pressure, besides this exercise can also improve the function of vasodilation which can reduce peripheral vascular resistance. If the elasticity of blood vessels increases, it will make it easier for blood vessels to relax quickly as the heart pumps blood. (Wratsongko, M. 2010). The purpose of this study was to analyze the effect of ergonomic gymnastics on blood pressure in pre elderly and elderly who experience hypertension in the Elderly integrated health center of Suko Village

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METHODS

Study design

This research design was pre-experimental, and the One-group approach was pre-post test design. In this study respondents will be measured blood pressure (Pre-test) then respondents will be given an ergonomic gymnastic intervention for twice a week with a duration of 30 minutes. Respondents came to the elderly posyandu twice a week (every Wednesday and Saturday) to attend in the ergonomic exercises provided by the researchers in accordance with the standard operating procedures that had been made. During the implementation of ergonomic exercise, researchers were accompanied by doctors and nurses from the Public health center to prevent injuries to respondents. After being given treatment the researchers took blood pressure measurements (Post-test). The post-test data collection was carried out when the respondent visited the Integrated Elderly Health Center on schedule (Wednesday) the following week after being given the intervention.

Settings

The research was conducted in Integrated Health Center of Elderly, Suko Village, Sukodono, Sidoarjo in February 2020.

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Research subject

The population in this study were all pre-elderly and elderly in Elderly integrated health center Suko Village Sukodono Sidoarjo as many as 25 people who met the inclusion criteria: 1) active in Elderly integrated health center, 2) willing to be a respondent, 3) suffer from hypertension with blood pressure more than 120/80. Exclusion criteria: 1) have comorbidities (asthma, physical disabilities, heart disease, psychosis, osteoporosis, etc.), 2) limited level of motion. Drop out criteria: elderly who did not follow the intervention overall (4 times or twice a week). The sample of this study were 23 respondents and were taken by simple random sampling technique. The independent variable is ergonomic

gymnastic. The dependent variable is blood pressure.

Instruments

Instruments for measuring blood pressure using a sphygmomanometer and a stethoscope. The data collected through observation, then tabulated the data and then grouped the data according to the sample.

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Data analysis

Data were analyzed using Wilcoxon Sign Rank test.

Ethical Consideration

This study has gone through an ethical test from Health Research Ethics Commission of Nahdlatul Ulama University, Surabaya with Number 17/EC/KEPK/UNUSA/2020.

RESULT

Characteristics of Respondents by Gender and Age

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Based on table 1, the majority of respondents were female (87%) and the range of age between 60-74 years old (69,6%).

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Table 1 Distribution of Respondents by Gender and Age in Integrated Health Center of Elderly, Suko Village, Sukodono, Sidoarjo in February 2020 (n = 23).

Characteristics of Respondents	Frequency (f)	Percentage (%)
Sex		
Male	3	13.0
Female	20	87.0
Age		
45-59 y.o	7	30.4
60-74 y.o	16	69.6

Sources: Primary Data of Questionnaire, 2020.

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 Analysis of the Effect of Ergonomic Gymnastic on Blood Pressure among Elderly using Wilcoxon Sign Rank Test

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Table 2 The Effect of Ergonomic Gymnastic on Blood Pressure among Elderly in Integrated Health Center of Elderly, Suko Village, Sukodono, Sidoarjo in February 2020 (n = 23).

No	Blood pressure	Before		After	
		(F)	(%)	(F)	(%)
1.	Hypertention	16	69.6	3	13.0
2.	Pre-hypertension	3	13.0	2	8.7
3.	Normal	4	17.4	18	78.3
	Total	23	100.0	23	100.0

Wilcoxon Sign Rank Test $p=0.000$

Sources: Primary Data of Questionnaire, 2020.

Based on the table above shows before being given treatment, most respondents experienced hypertension (69.6%). After being given treatment for 4 times in 2 weeks with 30 minutes, almost most of the respondents had a normal blood pressure (78.3%).

From the results of statistical tests using the Wilcoxon Sign Rank Test before and after doing ergonomic gymnastics, the value of $p = 0,000$ where $p < 0,05$, which means there is an influence of ergonomic gymnastics on reducing blood pressure.

DISCUSSION

Blood Pressure in the Pre Elderly and Elderly Before Doing Ergonomic Gymnastics

Based on table 3 shows that before being given treatment, some respondents as many as 16 respondents (69.6%) experienced blood pressure with less categories, namely between $\geq 160 / > 100$ mmHg.

This is supported by the theory of Suiroaka (2015) which states that hypertension can be caused by controlled and uncontrolled factors. Controlled factors include obesity, excessive salt consumption, smoking, alcohol consumption, lack of exercise and stress, while uncontrolled factors include heredity, gender and age.

But in this study there were 4 respondents (17.4) whose blood pressure was in the good category before being given ergonomic gymnastics. This is supported by Harvard Men's Health Watch (2010) theory which states that changing lifestyles in people with hypertension is very beneficial for lowering blood pressure. Some lifestyle patterns that need to be improved are weight loss if overweight, reduce drinking alcohol, increase aerobic physical activity, reduce salt intake, maintain adequate potassium intake, and adequate magnesium, stop smoking, reduce intake of saturated fat and cholesterol. Meanwhile, according to researchers, the factors that influence normal blood pressure in the elderly in the Suko village are always routinely for health checks to the doctor once a month. From the interviews of researchers with Elderly integrated health center cadres, the respondent has a history of hypertension. The results of the respondent's statement, the respondents routinely to take medication and avoid foods that are high in fat and high in salt, even though the respondent has a history of hypertension.

From the research results obtained in table 1 that half of respondents aged 60-74 years old (67.6%). This is in accordance with the theory of Suiroaka (2012) which states that the greater the age a person will suffer from hypertension. Loss of tissue elasticity, dilation of blood vessels and atherosclerosis are the causes of hypertension. Hypertension will attack men over the age of 31 years old and in women occurs after the age of 45 years old.

Blood Pressure in Pre-Elderly and Elderly After Performing Ergonomic Gymnastics

The results of the study after being given treatment, as many as 18 respondents (78.3%) experienced a decrease in blood pressure into a good category. Ergonomic gymnastics is a gymnastic movement combined with breathing techniques. This gymnastics consists of 6 movements, namely perfect standing movements, graceful movements, thanksgiving movements, mighty sitting movements,

burning seated movements, and resigned lying down movements. Each ergonomic gymnastic has many benefits in maintaining a healthy body, especially in the health of the heart and blood vessels. After doing ergonomic gymnastics properly and routinely can make a good immune system that affects blood pressure (Wratsongko, 2015). This is in accordance with the theory of Suiraoaka (2012) which states that exercise can accelerate blood circulation in the body so that it can reduce blood pressure. Wratsongko (2015) states that one sport that can reduce blood pressure is ergonomic gymnastic. Ergonomic gymnastics can improve blood circulation, maximize oxygen supply throughout the body and can achieve maximum relaxation so that it can affect blood pressure. Ergonomic gymnastic movements can be done in sequence as routine exercise every day, or at least 2-3 times a week (Sagiran, 2012). But in this study there was 1 respondent (4.3%) whose blood pressure increased even though it was still in the good category. This is supported by Corwin's theory (2010) which states that hypertension increases due to heart rate, stroke volume, and high intake of salt, small arterial and arterial vasoconstriction, stress, and genetics. According to researchers this can be caused by many factors that affect blood pressure even though they have done ergonomic gymnastics, for example respondents are in a tired condition before gymnastics starts, respondents have high stress levels, respondents have a history of hypertension.

3 Analysis of the Effect of Ergonomic Gymnastic on Blood Pressure among Elderly

Based on the results of the study in table 2 before doing ergonomic gymnastics obtained the number of hypertensive patients with less categories as many as 16 respondents (69.6%), enough categories as many as 3 respondents (13.0%), good categories as many as 4 respondents (17.4%). After doing ergonomic gymnastics, the result of the number of hypertension sufferers with less categories is 3 respondents (13.0%), enough categories are 2

respondents (8.7%), and good categories are 18 respondents (78.3%). From the above data it can be shown that before doing ergonomic gymnastics most of them have hypertension with less categories and after doing ergonomic gymnastics most of them have decreased to good categories. This study analyzed data from the results of statistical tests using the Wilcoxon Sign Rank Test before and after doing ergonomic gymnastics obtained p -value = 0.000 where $p < 0.05$ which means H_0 is rejected, which means there is an influence of ergonomic gymnastics on reducing blood pressure in pre elderly and elderly who experience hypertension in the Elderly integrated health center Suko Village, Sukodono District, Sidoarjo Regency. Based on the analysis of research that has been conducted by researchers for four times in two weeks, the results obtained are very significant for a decrease in blood pressure that is almost all respondents experienced a decrease of 18 respondents out of 23 respondents. Ergonomic gymnastics is an effective, efficient and logical exercise because ergonomic gymnastic movements are a series of prayer movements. Ergonomic gymnastics are very beneficial for the body, doing ergonomic gymnastics regularly can increase muscle strength and effectiveness of heart function, expedite the respiratory system and prevent hardening of the arteries. Regular ergonomic gymnastic can increase good cholesterol (HDL) which is beneficial for heart and blood vessel health. Ergonomic gymnastic can also prevent osteoporosis, lower blood sugar, and other diseases. In ergonomic gymnastic movements that can reduce blood pressure is the mighty sitting motion, because in this movement can make the chest muscles and ribs become stronger, so that the chest cavity becomes larger and the lungs develop properly so that it can suck more oxygen and increase blood flow to the body over the body, especially the head, eyes, ears, nose and lungs (Wratsongko, 2015).

However, in this study there were 4 respondents (17.4) whose blood pressure remained constant ie there was no change in

blood pressure before and after doing ergonomic gymnastics. This is supported by the theory of Laily (2017) which states that there are some things that cause blood pressure to remain in the fixed category even though treatment has been carried out including heredity, sex, age, weight, and lifestyle. According to researchers this can be caused by many factors that affect blood pressure even though they have done ergonomic gymnastics, for example respondents did not do ergonomic gymnastics seriously, the frequency of movements performed less, respondents still consume foods high in salt, and even more so if respondents have a history of hypertension or even respondents have high levels of stress that can affect blood pressure.

CONCLUSION

Most of elderly had hypertension before doing ergonomic gymnastic. After doing ergonomic gymnastic 4 times in one week, most of elderly had normal blood pressure. Ergonomic gymnastic can reduce blood pressure among elderly.

SUGGESTIONS

Future studies are expected to be able to compare ergonomic gymnastics with elderly exercises to reduce blood pressure in the elderly.

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DECLARATION OF CONFLICTING INTEREST

The authors declare that they have no conflict of interest.

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AUTHOR CONTRIBUTION

Yurike Septianingrum: Designed the study, contributed to the interpretation to the result, and wrote final manuscript.

Moh Haris Susanto: Collected and analyzed data, developed the instruments, and drafted the manuscript.

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None.

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