

Effect of hypertension exercise on blood pressure in the elderly

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Abstract

Hypertension is when systolic blood pressure is greater than 140 mmHg, and diastolic blood pressure is greater than 90 mmHg caused by complex factors and related conditions. Hypertension in the elderly often occurs because cell structure and function change with increasing age, affecting health and disease. Sports such as hypertension exercise can encourage the heart to work optimally. The blood vessels will stretch, and blood flow will decrease temporarily for about 30-120 minutes. It will return to blood pressure before doing the exercise. This study aims to determine the effect of hypertension exercise on blood pressure in the elderly in Legonkulon village, Subang regency, West Java, Indonesia, in 2022. This quantitative research method has a Pre-experiment design one group. The population in this study were all hypertensive elderly in Legonkulon Village, 104 people in the UPTD Puskesmas Legonkulon Subang Regency. Sampling using the formula Slovin with purposive sampling technique as many as 51 people meet the research criteria. The instruments used are an aneroid spectrum sphygmomanometer, stethoscope, and observation sheet. The data analysis technique used is the Wilcoxon Signed Rank Test. The results of statistical tests obtained p-value = 0.000. The hypothesis concludes that hypertension exercise affects blood pressure in the elderly.

Keywords: Elderly; Hypertension; Exercise; Blood Pressure; Effect

1. Introduction

A person who has reached the age of 60 years or more is considered elderly [1]. The Elderly is an age group in humans who have entered the final stages of their life phase [2]. The elderly go through a process called the aging process [3]. The aging process is a gradual loss of tissue's ability to repair itself or replace itself and maintain its typical structure and function so that it cannot survive injury [including infection] and repair the damage suffered [4]. With increasing age, body organs will decrease due to natural factors or diseases called degenerative diseases, one of which is hypertension [5].

Hypertension is an important thing to pay attention to when aging [6]. Hypertension is when systolic blood pressure is more significant than 140 mmHg, and diastolic blood pressure is greater than 90 mmHg caused by complex factors and related conditions [7,8]. Hypertension based on age group, the higher a person's age, the more at risk for developing hypertension, 55.2% for 55-64 years old, 63.2% for 65-74 years old, and 69.5 years old and over [9–11].

The prevalence of hypertension globally is 22% of the total world population [12]. The African region has the highest prevalence of hypertension at 27%. Southeast Asia is in the 3rd most elevated position, with a majority of 25% of the total population [13,14]. Meanwhile, in Indonesia, the prevalence of hypertension in the population > 18 years is 34.11% [15]. In West Java, Indonesia, in 2018 showed, a hypertension prevalence of 39.6% [15]. [16].

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Hypertension exercise is a sport aimed at improving blood flow and oxygen supply to active muscles and the skeleton, particularly the heart muscle [17,18]. Gymnastics or exercise can cause oxygen in the cells to increase energy formation, heart rate, cardiac output, and stroke volume, increasing blood pressure [19]. After exercising, the blood vessels stretch, and blood flow decreases quickly; after 30-120 minutes, it returns to the pre-exercise blood pressure. The decline in blood pressure will be more elastic if you exercise routinely and consistently. The mechanism for lowering blood pressure after exercise is that activity relaxes blood vessels, causing blood pressure to drop as a result [20].

The results of a preliminary study conducted by researchers on October 11, 2021, at the UPTD of the Legonkulon Health Center, Subang Regency, found that the number of elderly respondents living in Legonkulon Village from the age of 60-70 years and above was 51 people. The examination results were 31 people with mild hypertension and 20 people with moderate hypertension. One of the efforts made in the elderly with hypertension is doing light exercise such as hypertension exercise.

Based on the description above, the aging process is natural and cannot be avoided. Reducing the prevalence of hypertension in the elderly can be done by physical exercise. However, not all physical activity can be done in the elderly, considering that the mobilization of the elderly is very limited. Therefore, researchers use hypertension exercise that can be done by the elderly without being burdensome as a research intervention to reduce blood pressure in the elderly with hypertension.

2. Methods

This study uses a quantitative method with a pre-experimental design with a one-group pre-test and post-test design [21]. The population in this study were all elderly suffering from hypertension in Legonkulon Village, UPTD Puskesmas Legonkulon Subang Regency, as many as 104 people, and a sample of 51 people using the purposive sampling technique following the research criteria. Hypertension exercise is a physical activity that aims to increase blood flow and oxygen supply to active muscles and the skeleton, especially the heart muscle, to reduce blood pressure and can be done three times/week for 30 minutes. Data collection using Aneroid Spectrum Sphygmomanometer, Stethoscope and observation sheet. Data analysis used the Wilcoxon Signed Rank Test.

3. Results and discussion

3.1. Characteristics of Respondents

Table 1 Characteristics of Respondents

		Frequency	Percentage
gender	M	18	35.3
	F	33	64.7
age	60-67	35	68.4
	68-74	16	31.6

Table 1 illustrates that in this study, the number of female elderly amounted to 18 [64.7%], more than the male elderly who amounted to 33 [35.3%]. Elderly aged 60-67 amounted to 35 [68.4%], more than the elderly old 69-74 which amounted to 16 [31.6%].

3.2. Respondents' Blood Pressure Categories

The distribution of the frequency of the hypertension category in the respondents can be seen that before the hypertension exercise was carried out, the respondents who experienced hypertension with the category of hypertension stage 1 or mild hypertension were 31 people [60.8%] and respondents with the category of hypertension stage 2 or moderate hypertension were 20 people [39, 2%]. Furthermore, the frequency distribution of the respondent's hypertension category in the post-test showed that most of the respondents who experienced hypertension in the high normal category were 23 people [45.1%] and respondents with stage 1 category [mild hypertension] were 28 people [54.9%].

Table 2 Respondents' Blood Pressure Categories

Categories	Frequency		Percentage	
	Before exercise	After exercise	Before exercise	After exercise
Normal high	0	23	0	45.1
Hypertension Stage 1	31	28	60.8	54.9
Hypertension Stage 2	20	0	39.2	0

3.3. Effect of Hypertension Exercise on Blood Pressure in the Elderly

The results of the Wilcoxon Signed Rank Test show that the effect of hypertension exercise on blood pressure in the elderly is as follows.

Table 3 Wilcoxon Signed Rank Test Results

	Blood pressure values before exercise				p-value
	hypertension category	Normal high	Hypertension Stage 1	Total	
	Number of People				
Blood pressure values after exercise	Hypertension Stage 1	18	13	31	0,000
	Hypertension Stage 2	5	15	20	
	Total	23	28	51	

The Wilcoxon Signed-Rank Test results show differences in blood pressure values before and after hypertension exercise in the elderly with hypertension. Hypertension stage 2 [moderate hypertension] in as many as 20 people [39.2%]. Hypertension stage 2 [moderate hypertension] as many as 20 people [39.2%]. Then after being given hypertension exercise, there was a change in the respondent's blood pressure into the normal high category as many as 23 people [45.1.%] and as many as 28 people [45.9%] including the category 1 hypertension with a p value of 0.000 with a level of 0, 05 which means that there is an effect of hypertension exercise on blood pressure in the elderly with hypertension.

Based on the results above, there is a statistically significant effect between exercise and blood pressure conditions in the elderly. In Taiwan, Jen-Chen Tsai et al. supported this study that exercise can lower blood pressure and improve patients' quality of life [22]. Leandro et al. said physical activity helps control blood pressure in the human body [23]. In addition, Zhu et al. said that yoga and walking could be an option as a treatment tool for people with hypertension [24].

4. Conclusion

Blood Pressure Prior to hypertension exercise, the majority of respondents had stage 1 hypertension as many as 31 people. After doing hypertension exercise, the majority of respondents had stage 1 hypertension as many as 28 people. Based on the Wilcoxon Signed Rank Test before and after hypertension exercise, a p value of 0.000 < 0.05 was obtained, so that there was a significant effect of hypertension exercise on changes in blood pressure in the elderly in Legonkulon Village, Working Area of UPTD Puskesmas Legonkulon, Subang Regency in 2022.

Compliance with ethical standards

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Disclosure of conflict of interest

No conflict of interest.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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