



# Hypertension Exercise Videos Reduce Blood Pressure of Hypertension Patients

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## Abstract

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**BACKGROUND:** Hypertension is a symptom of a cardiovascular degenerative disease that is mostly experienced by the elderly and cause is not certain. However, the reduction of blood pressure (BP) with drugs and nondrugs can reduce damage to target organs and prevent cardiovascular diseases.

**AIM:** the study identified the effect of hypertension exercise videos of lowering BP.

**METHODS:** The type of research that has been used is quasi-experimental with pre-test and post-test design with control group. The sampling technique used was random sampling, the number of samples was 30 samples which were the treatment group and 30 samples were control the control group. The data analysis used was the t-test and Wilcoxon and Mann-Whitney test.

**RESULTS:** The mean reduction in systolic BP in respondents who did exercise was 13.67 mm Hg with a standard deviation of 10.57, while the mean in systolic BP in respondents who did not exercise was 0.50 mmHg a pressure were 40.95 in the group of respondents who did hypertension exercise with  $p = 0.000$ . This means that there is significant difference, in the mean reduction in systolic and diastolic BP between respondents those who do exercise.

**CONCLUSION:** Hypertension exercise video reduces BP of hypertension patients.

## Introduction

Hypertension is a symptom of a cardiovascular degenerative disease that is mostly experienced by the elderly and the cause is not certain. Hypertension is the most common risk factor for cardiovascular disease leading to death. However, lowering blood pressure (BP) by drugs and non-drug and non-pharmaceutical methods will reduce damage to target organs and prevents cardiovascular diseases [1].

Hypertension is a major contributor to short life expectancy for African Americans. Lifestyle changes as an intervention cannot yet be developed, especially for young African American men. Hypertension in society requires lifestyle changes as a form of developing education and knowledge about hypertension [2].

The prevalence of hypertension measured by BP has increased from 25.8% to 34.1%. The increase in prevalence of hypertension is related to lifestyle, including smoking, consumption of alcoholic drinks, physical activity, and consumption of fruits and vegetables [3].

In adult, a 20 mmHg increase in systolic BP results in a 60% increase in the risk of death cause by cardiovascular disease. It is estimated that about 80%

of the increase in cases of hypertension, especially in developing countries in 2025 from a total of 639 million cases in 2000, is estimated to be 1.15 billion cases in 2025 [4].

Hypertension is a health problem that often occurs in society. Uncontrolled hypertension can lead to degenerative disease, such as congestive heart failure, and vascular disease. Hypertension is called the "silent killer" because it is asymptomatic and after several years leads to fatal strokes or heart disease. Although it cannot be treated, prevention and management can reduce the incidence of hypertension, and its accompanying diseases [5].

Handling/treating hypertension, all respondents must have adherence to control effectively and receive regular multiple interventions both drugs and other alternatives [4], [6]. The use traditional medicines in hypertension and related diseases can lead to poor outcomes, associated with delays in seeking appropriate treatment, leading to increased disease severity or complication, drug interactions, and adherence to allopathic drugs known to control the disease [4], [7].

Hypertension cannot be treated, but preventive and management measures can be taken such as providing health education to reduce the

number of cases of hypertension and the disease that accompany it. Effort made to prevent hypertension and reducing salt consumption; consuming foods containing potassium, magnesium and calcium; reducing drinking or alcoholic foods; regular exercise; eat high-fiber vegetables and fruits; reduce stress; stop smoking; controlling cholesterol level; and controlling diabetes. Therefore, families who have a history of hypertension must get sufficient knowledge about hypertension and the right action to lower BP. If not treated seriously, hypertension can cause serious complications, including heart infarction, heart failure, stroke, and chronic kidney failure [8]. The most easily handled non-pharmacological hypertension for families is reflexology [9]. In study, it explained that there were significant differences in systolic and diastolic BP before and after given intradialytic exercise [10], [11].

A preliminary study conduct few months before the study through interviews with ten people with hypertension showed that seven people with hypertension had never done exercise or physical exercise. The other three people have done exercise, but they do not do it all now because the feel that they are doing physical exercises such as doing household chores. Based on the explanation above, the researcher wanted to find out whether the hypertension exercise video could lower BP among people with hypertension. The research objective is a hypertension exercise video that has an effect on reducing BP.

## Methods

The research design used was quasi-experimental pre-post-test with control group. The study was conducted for 12 weeks (3 months). Sampling technique is random sampling, with sample of 30 experimental groups and 30 control groups. Before being given the treatment and after being given the hypertension gymnastic treatment, BP measurements were taken both in the experimental group and in the control group (on the 1<sup>st</sup> week and at the 12<sup>th</sup> week). The experimental group was guided to do hypertensive exercise for 30 min 3 times a week and exercise for 12 weeks. Meanwhile, the control group did the exercise once per week, as usual the respondents had done. Data analysis used was t-test, Wilcoxon, and Mann–Whitney.

## Results

The mean age of the respondents who participated in exercise was 51.52 years (95% CI: -2.52–3.36), with a standard deviation of 6.80. The

youngest is 40 years old and the oldest is 61 years. Meanwhile, the mean of respondents who did not participate in exercise hypertension was 51.2 years, with a standard deviation of 4.29. The youngest was 43 years old and the oldest was 58 years old. More details are shown in Table 1.

**Table 1: Distribution frequency age of respondents characteristic**

Group	Mean	SD	95%CI
Intervention	51.53	6.81	2.51–3.37
Control	51.1	4.29	2.52–3.39

Based on the data, it was found that the majority of respondents who experience hypertension were female 30 peoples (55%), with the majority of high school education levels were 18 peoples (60%), and nearly half of the respondents had hypertension for <1 years around 27 (48%). More results are given in Table 2.

Before statistical analysis, an assumption test or normality test is carried out. Based on the results of the normality distributed, systolic BP results in the exercise group, diastolic BP in both the intervention group and control, while the data that were not normally distributed were the diastolic pressure data in the control group.

Based on Table 2, it shows that it shows that the systolic BP variable of hypertension respondents in both the intervention group and the control group is  $p > 0.05$ , so it can be concluded that the systolic BP data of hypertension respondents are normally distributed. The diastolic BP variable in the control group  $p > 0.05$  means that it is normally distributed, while the diastolic BP in the intervention group  $p < 0.05$  means that the data are not normally distributed. The data were not normally distributed analyzed using Wilcoxon and Mann–Whitney.

**Table 2: Distribution of respondents, by gender, education, and length of living with hypertension**

Characteristic	Group	
	Intervention Frequency (%)	Control Frequency (%)
Gender		
Female	83.3	33.3
Male	16.7	66.7
Education		
Elementary	23.33	10.0
Junior	46.7	35.0
Senior	30.0	46.7
University	0.0	8.3
Length of hypertension		
0–1 year	38.5	56.7
2–3 years	34.6	30.0
4–5 years	19.2	10.0
6–7 years	0.0	3.3
10–11 years	7.7	0.0

Based on analysis in Table 3, it showed that there was significant difference in the mean of systolic BP of respondents who did hypertension group with  $p = 0.02$ , while in the control group there is no difference in the mean systolic BP at week 1 with week 12, with  $p = 0.81$ .

Based on Table 4, it showed that there is difference in the Mean Ranks of distolic BP at week I and week XII both for intervention group and control group with  $p = 0.000$  for intervention group and  $p = 0.048$  for control group.

**Table 3: Mean of respondent systolic BP pre- and post-hypertension exercise (n = 30)**

Variable	Group	Mean	SD	p-value	n
Systolic	Intervention (Pre post)	139 (125.33)	9.23 (10.52)	0.02	30
	Control (Pre post)	135.67 (135.17)	10.06 (11.33)	0.81	30

BP: Blood pressure.

Based on Table 5, it showed that the mean decrease in systolic BP in respondents who did exercise was 13.67 mmHg with standard deviation of 10.57, while the mean decrease in systolic BP in respondents

**Table 4: BP among respondent before and after hypertension exercise**

Variable	Intervention			Control		
	Mean ranks	z	p	Mean ranks	z	p
Pre post	6.00 (13)	-4.002	0.000	7.33 (7.55)	1.976	0.048

BP: Blood pressure.

who did not exercise was 0.50 mmHg with standard deviation 11.17, with value of 0.000 ( $0 < 0.05$ ), this means that hypertension exercise can lower systolic BP.

**Table 5: Mean decreasing of BP among of intervention and control group after hypertension exercise**

Variable	Mean	SD	n	p-value
Systolic				
Intervention	13.67	10.57	30	0.000
Control	-0.50	11.17	30	0.000

BP: Blood pressure.

Based on Table 6, it showed that the mean ranks decreased in diastolic BP in respondents who did exercise was 40.95 with Z value of -4.896 while the group who did not exercise hypertension decreased diastolic BP with mean ranks of 20.05 for respondents who did not exercise with the mean ranks with  $p = 0.000$ .

**Table 6: Mean decreasing diastolic BP among intervention group and control group**

Variabel	Mean Ranks	Z	n	p-value
Diastolic				
Intervention	40.95	-	30	0.000
Control	20.05	4.896	30	

BP: Blood pressure.

## Discussion

Characteristics of the majority of respondents were female in the intervention group, whereas in the control group, the majority were male. Most respondents have junior high school education in the intervention group experienced hypertension for <1 years as well as more than half of the control group respondents also experienced hypertension for <1 year.

The results of this study indicate that hypertension exercise can significantly reduce the BP of hypertensive patients, which can reduce systolic BP with  $p = 0.000$ , and it can also reduce diastolic BP with  $p = 0.017$ , this is with other studies, namely, the effect aerobic exercise on hypertension among adult people and elderly [10]. This studies show that exercise is an adjuvant therapy in the management of hypertension [10], [11], [12].

This research is line with other research that exercise can control BP has been shown to be an effective and integral component of non-pharmacological interventions for BP control [13]. It is also in line with other studies that the training exercise program significantly reduced the systolic and diastolic outpatient day time BP by  $6 \pm 12$  and  $3 \pm 7$  mm Hg, respectively ( $p = 0.03$ ). Regular exercise reduces BP during activity and improves physical performance as assessed by maximal oxygen uptake and lactate level. Physical exercise can lower BP [14].

This is also in line with other studies that hypertension exercise can reduce BP in the elderly and hypertension exercise can be used as one of the independent interventions to the lower BP [12], [13]. This research is that supports this research is the other studies The intradialytic exercise can reduce systolic BP with p-value of 0.002 and can reduce diastolic BP in patients undergoing hemodialysis with p-value of 0.014 [15], [16], [17].

Hypertension exercise is a sport, one of which aims to increase blood flow and oxygen supply to the active muscles and skeleton, especially for the heart muscle. By exercising or exercising, the need for oxygen in the cells will increase for the energy formation process, resulting in an increase in the heart rate so that cardiac output and stroke volume increases [18]. Thus, the BP will increase. After resting, the blood vessels will dilate or stretch and the blood flow will drop temporarily, about 30–130 min later it will return to the BP before exercise. If you do exercise regularly and continuously, the decrease in BP will last longer and the blood vessels will be more elastic. The mechanism of lowering BP after exercise is because exercise can relax blood vessels and BP will drop [19].

Exercise has an antihypertensive effect although not completely, exercise or exercise video can reduce vasoconstriction which is triggered by sympathetic nerve work and reduced catecholamine, increases insulin sensitivity, has anti-inflammatory effect, and increase structural adaptation of vascular [10].

## Conclusion

Significantly hypertensive exercise reduces systolic and diastolic BP of hypertensive patients.

## Recommendation

Encourage regular hypertension exercise for 30 min times a week to reduce BP of hypertensive patients.

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