

The Effect of Brisk Walking Exercise on Blood Pressure in Hypertensive Patients

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Abstract—Hypertension is a disease that can cause dangerous complications such as heart failure, kidney failure, coronary heart disease, stroke and brain damage. During the World Health Organization (WHO) period (2015-2020), approximately 1.13 billion people worldwide were diagnosed with hypertension. **Objective:** The aim of this research is to determine the effect of Brisk Walking Exercise on blood pressure in hypertensive patients. **Methods:** This research method uses quantitative research with a pre-experimental design with a one group pretest and posttest design. Sampling was taken by total sampling with a sample of 20 respondents. Data analysis uses univariate and bivariate. The analysis technique uses the Normality Test and the Wilcoxon signed rank test. **Results:** The results of the pretest frequency distribution before the Brisk Walking Exercise were carried out were obtained by 13 respondents (65%) with Stage 1 (Mild Hypertension) and the results of the posttest after the Brisk Walking Exercise were carried out were obtained by 12 respondents (60%) with the Normal category Below 130/85 mmHg. The results of the normality test with Shapiro Wilk showed Sig. (Significant) namely 0.001 during the pretest and 0.000 during the posttest, the distribution is not normal because the p -value $< 0,005$. Based on the results of hypothesis testing using the Wilcoxon Signed Rank Test, it was found that p -value = 0,000, which means p value $\leq 0,005$, so H_a was accepted and H_o was rejected. **Conclusion:** there is an influence of Brisk Walking Exercise on blood pressure in hypertensive patients. This research suggests that respondents can use the Brisk Walking Exercise as additional information to add information about alternative non-pharmacological therapies that can be done independently at home to reduce blood pressure in hypertension sufferers.

Keywords— Blood Pressure; Brisk Walking Exercise; Hypertension.

I. INTRODUCTION

Increasing age in a person has the potential for the emergence of diseases caused by the effects of aging, one of which is hypertension.¹ Hypertension is a problem because it is often found in the elderly and is a major factor in heart disease.² Hypertension is a condition in which blood pressure in the blood vessels increases chronically, this is because the heart works harder to pump blood to meet the body's need for oxygen and nutrients and if not controlled it can affect the function of other organs, the most important organs such as the heart and kidneys.³ Hypertension is caused by problems associated with an abnormal and persistent increase in blood pressure caused by one or more factors that do not function properly to maintain normal blood pressure.⁴

Data on hypertension according to the World Health Organization (WHO) for the period (2015-2020), around 1,13 billion people in the world have been diagnosed with hypertension, and the number of hypertension cases continues to increase every year, it is estimated that by 2025 there will be 1,5 billion people who suffer from hypertension. suffer from hypertension and it is estimated that every year 9,4 million people die from hypertension and its complications.⁵ The prevalence of hypertension in Indonesia in 2018 was 34,1%, while in 2013 it was 25,8% and experienced a significant increase in those aged over 60 years by 25.8%.⁶ In Indonesia, the estimated number of hypertension cases is 63.309.620

people, while the death rate in Indonesia due to hypertension is 427.218 deaths, hypertension occurs in the age group 31-44 years (31,6%), age 45-54 years (45,3%), aged 55-64 years (55,2%).⁷ West Java Province is in second place with the highest prevalence of hypertension, namely 39,60% and the highest prevalence in West Java is in Ciamis Regency with a prevalence of 49,6%. Bandung City itself has a prevalence of 36,79%.⁸ In 2015 in West Java there were 530.387 cases of hypertension (0,07 for the total population ≥ 18 years).⁹ The prevalence of hypertension in Bogor Regency is 4,96% with an absolute figure of 162.865 cases.¹⁰

Hypertension is influenced by many factors that play an important role and cause blood pressure to increase, including factors that cause the risk of hypertension that cannot be controlled (major) and factors that can be controlled (minor), factors that cannot be controlled such as heredity and age, while factors that can be controlled are obesity, cholesterol, caffeine, lack of exercise or lack of activity, smoking, sodium sensitivity, alcohol consumption, stress, and poor eating patterns.¹¹ If hypertension continues to increase, it will cause damage to blood vessels because substances important for life, such as heart cells, will be disturbed.³ Therefore, if hypertension does not receive treatment, it will have risk factors that cause heart failure, stroke, coronary heart disease, brain damage and kidney failure.¹²

In general, treatment of hypertension can be done in two ways, namely it can be treated by carrying out therapeutic

management (Pharmacological) where this therapy is carried out by administering antihypertensive drugs such as Furosemide, Metoprolol, Captopril, Prazosin, Amlodipine and Methyldopa while (Non-pharmacological) where therapy This is by doing exercise, physical activity, healthy eating patterns, limiting excessive salt consumption, getting enough rest, avoiding stress, stopping consuming alcohol and smoking.¹¹ One of the non-pharmacological therapies is the Brisk Walking Exercise, where this therapy is a relaxation exercise with aerobic exercise methods recommended by the 3 European and American Hypertension Guidelines to reduce blood pressure.⁶

According to the American College of Sports Medicine, moderate intensity exercise or physical activity such as the Brisk Walking Exercise can reduce the mortality of people with cardiovascular disorders such as hypertension.⁶ *Brisk Walking Exercise* as a form of aerobic exercise (exercise) which is a form of moderate activity exercise for hypertensive patients using fast walking techniques for 20-30 minutes at a speed of 4-6 km/hour.⁴ The advantages of this exercise are that it is effective enough to increase heart rate capacity, stimulate muscle contractions and breakdown of glycogen, increase tissue oxygenation and reduce plaque formation through increased utilization of fat and glucose.⁴

Based on the background described above, researchers are interested in researching "The Effect of Brisk Walking Exercise on Blood Pressure in Hypertension Patients".

II. MATERIALS AND METHODS

The research uses quantitative methods with a Pre-experiment research design: One-Group Pretest-Posttest Design. This study included hypertensive patients of Melati posyandus in Bogor Regency, a total of 20 respondents. The sampling technique used in this research was not random (total sampling) with a total of 20 respondents. This research was carried out at Posyandu Melati, Cijayanti Village, Bogor Regency and the time of the research was carried out on January 31, 2024. The data collection method in this research was a pretest-posttest sheet containing the effect of the Brisk Walking Exercise before and after the intervention was carried out on hypertensive patients at Posyandu Melati Cijayanti Village, Bogor Regency. The independent variable, namely Brisk Walking Exercise Therapy, will be measured using: Blood Pressure SOP Sheet, Brisk Walking Exercise SOP Sheet, Brisk Walking Exercise Video, and Blood Pressure Observation Sheet. Brisk walking exercise is carried out for 30 minutes (5 minutes warm-up, 20 minutes walking exercise, and 5 minutes cool-down). The blood pressure measurement categories are divided into:

1. Normal blood pressure Systole: 130 mmHg, Diastole: Below 85 mmHg
2. Normal High blood pressure Systole: 130-139 mmHg and Diastole: 85/89mmHg
3. Stage=1 (Mild Hypertension), Systole: 140-159 mmHg and Diastole: 90-99 mmHg
4. Stage=2 (Moderate Hypertension), Systole: 160-179 mmHg and Diastole: 100-119 mmHg.
5. Stage=3 (Severe Hypertension), Systole: 180-209 mmHg and Diastole: 110-119 mmHg.

To determine the difference before and after fatigue, it will be measured using the Wilcoxon Signed Rank Test.

III. OBSERVATION AND RESULTS

Table 1 shows that the majority of respondents were aged 30-45 years, namely 12 people (60%). Based on gender, the majority of respondents were female (85%). Most of the respondents' jobs were not working, namely 70%. Most respondents had elementary school education (90%).

TABLE 1. Distribution of Respondent Characteristics based on Age, Gender, Occupation and Education

S.No.	Respondent Characteristics	Frequency	Percentage (%)
1	Age		
	30-45 years	12	60
	50-60 years	5	25
	61-75 years old	3	15
2	Gender		
	Man	3	15
	Woman	17	85
3	Work		
	Work	6	30
	Doesn't work	14	70
4	Education		
	elementary school	18	90
	junior high school	1	5
	high school	1	5

TABLE 2. Frequency Distribution Based on Blood Pressure Before Brisk Walking Exercise

S.No	Blood pressure Before Action	Frequency	Percentage (%)
1.	Stage 1 (Mild Hypertension)	13	65
2.	Stage 2 (Moderate Hypertension)	7	35
3.	Stage 3 (Severe Hypertension)	0	0

Based on table 2, Frequency Distribution of Blood Pressure Before the Brisk Walking Exercise was Performed on Respondents at Posyandu Melati, Cijayanti Village, Bogor Regency, out of 20 respondents, the results showed that 13 respondents (65%) had blood pressure in the Stage 1 category (Mild Hypertension).

TABLE 3. Frequency Distribution Based on Blood Pressure After Brisk Walking Exercise

S.No	Blood pressure After Action	Frequency	Percentage (%)
1.	Normal	12	60
2.	(Below 130/ 85 mmHg)	8	40

Based on Table 3, Frequency Distribution of Blood Pressure After Carrying Out the Brisk Walking Exercise on Respondents at Posyandu Melati, Cijayanti Village, Bogor Regency, out of 20 respondents, the results were 12 respondents (60%) with blood pressure in the Normal category below 130/85 mmHg.

TABLE 4. Hypothesis Test Results Wilcoxon Signed Rank Test Effect of Brisk Walking Exercise on Blood Pressure in Hypertension Patients

	Posttest – Pretest
Z	-4.099b
Asymp Sig (2-tailed)	0,000

Based on Table 4 Hypothesis test results using the Wilcoxon Signed Rank Test, P value = 0,000, which means P value \leq 0,005. So H_a was accepted and H_o was rejected so that there was an effect of Brisk Walking Exercise on Blood Pressure in Hypertension Patients at Posyandu Melati, Cijayanti Village.

IV. DISCUSSION

a. Blood Pressure in Hypertensive Patients Before Being Given the Brisk Walking Exercise Technique

Results of the frequency distribution of blood pressure before the action is carried out Brisk Walking Exercise among respondents at Posyandu Melati, Cijayanti Village, Bogor Regency, out of 20 respondents, 13 respondents (65%) had blood pressure in the Stage 1 category (Mild Hypertension).

This is supported by Elsa Dwi Astuti's 2020 research entitled The Influence of Method Brisk Walking Exercise on Blood Pressure in Hypertensive Patients at the Husada Clinic Gunungkidul with the results of research on reducing blood pressure at the Husada Clinic Gunungkidul. Of the 35 respondents who had hypertension, there were 20 respondents (57,10%) who had category 2 hypertension before the brisk walking exercise was carried out. ¹

Hypertension or high blood pressure is the main factor in the occurrence of cardiovascular disease where blood pressure is above the normal limit. Hypertension can disrupt blood flow in the kidneys, heart and brain. This has an impact on increasing the occurrence of kidney failure, coronary heart disease, stroke and dementia. The risk factors that cause hypertension are age, gender, heredity (genetics), obesity, smoking, excessive alcohol and caffeine consumption. ¹³

Based on this research, it can be concluded that blood pressure can be caused by age, activity level, gender and irregular eating patterns which can cause a person suffering from high blood pressure to increase in an instant. High blood pressure should be treated regularly and change all habits that can cause an increase in high blood pressure and control these habit patterns for the better. One way is to do alternative non-pharmacological therapy in the form of brisk walking exercise therapy.

b. Blood Pressure in Hypertensive Patients Before Being Given the Brisk Walking Exercise Technique

Results of the frequency distribution of blood pressure after the procedure Brisk Walking Exercise among respondents at Posyandu Melati, Cijayanti Village, Bogor Regency, out of 20 respondents, 12 respondents (60%) had blood pressure in the Normal category.

This is supported by the results of research conducted by Mas'adah, Didah Ayu Wiantrari and Ridawati Sulaeman in 2021 with the title "The Influence" Brisk Walking Exercise on Changes in Blood Pressure of Hypertension Sufferers" based on these results, 30 respondents were obtained before the Brisk Walking Exercise was carried out, 20 respondents (66.70%) had hypertension and after the Brisk Walking Exercise was carried out from 30 respondents the results were obtained from 16 respondents (53 .30%) experienced changes in blood

pressure after doing the Brisk Walking Exercise for 3 days a week for 15-30 minutes, namely a decrease in blood pressure. ¹¹

Brisk Walking Exercise is an intervention that can reduce blood pressure in hypertensive patients. Brisk Walking Exercise is effective in stimulating muscle contractions, increasing the effectiveness of heart rate and oxygen in tissues and can break down glycogen. Brisk Walking Exercise can reduce the process of plaque formation through increased use. glucose and increased use of fat. ⁴

From the research results it can be concluded that patients who experience hypertension do Brisk Walking Exercise regularly at least 3 times a week with a duration of 15-30 minutes, hypertensive patients experience changes in blood pressure because this alternative exercise in the form of Brisk Walking Exercise is useful for lowering blood pressure for people with high blood pressure, this Brisk Walking Exercise training program can stimulate muscle contractions, increasing the maximum heart rate capacity in the body and increasing oxygen in the tissues, this exercise can reduce plaque formation caused by fat and glucose in the body, can maintain body balance and many other benefits that can be obtained from the Brisk Walking Exercise training program which will provided by the researcher.

c. Influence Brisk Walking Exercise on Blood Pressure in Hypertension Patients

The results of the hypothesis test using the Wilcoxon Signed Rank Test showed p value = 0,000, which means p value \leq 0,005. So, H_a is accepted and H_o is rejected so that there is an effect of Brisk Walking Exercise on Blood Pressure in Hypertension Patients at Posyandu Melati, Cijayanti Village, Bogor Regency.

This is supported by research by Hendriati, Saasa and Rinvil Amirudin in 2022 with the title "The Effect of Brisk Walking Exercise on Blood Pressure in Hypertension Patients in the Lambuya Health Center Working Area, Konawe Regency." Based on the Wilcoxon effect test results, the p-value is 0.000 because the p-value result is less than 0.005 or (0.000 < 0.005) then H_a is accepted and H_o is rejected so that there is an effect of Brisk Walking Exercise on blood pressure in hypertensive patients. ¹⁴

Hypertension, or hypertension disease, is a dysfunction of the blood vessels, as a result of which oxygen and nutrients transported by blood are prevented from reaching the tissues of the body that need it. ¹⁵ A person is said to be hypertensive if they have systolic blood pressure \geq 140 mmHg and diastolic blood pressure \geq 90 mmHg. Diastolic blood pressure is the main measurement that is the basis for determining the diagnosis of hypertension. ¹⁵

The Brisk Walking Exercise program is a form of physical exercise carried out systematically and functionally which aims to maintain health and improve physical fitness. The Brisk Walking Exercise is a type of aerobic exercise, namely an activity that uses fast techniques which are used as a complement to lower blood pressure in hypertensive patients. ¹³

Based on the results of this pretest and posttest research, it can be concluded that giving the Brisk Walking Exercise technique to hypertensive patients is a method that can help

reduce high blood pressure, for this reason respondents were able to do the Brisk Walking Exercise to maintain a healthy lifestyle, maintain stable blood pressure and do it Brisk Walking Exercise frequently and regularly three times a week will keep blood pressure normal.

V. LIMITATIONS OF STUDY

Research takes a long time to determine the effect of Brisk Walking Exercise on blood pressure in hypertensive patients.

VI. CONCLUSION

Brisk walking affects blood pressure in hypertensive patients. By carrying out alternative non-pharmacological therapy in the form of the Brisk Walking Exercise, blood pressure can be reduced significantly.

Conflict of Interest: None

REFERENCES

1. Astuti ED, Suryani E, Andriyani A. *The Effect of Brisk Walking Exercise on Blood Pressure in Elderly People with Hypertension at Mitra Husada Clinic Gunungkidul*. J Public Health and the Environment. 2020; Vol. 5:112–8.
2. Mulia S, Istiana D, Nur D, Purqoti S. *Effect of Brisk Walking Exercise on Reducing Blood Pressure in the Elderly*. Midwifery Nurse J Cent Res Pub. 2020;0(Vol 4 No 1 (2020) Center for Midwifery and Nursing Research Publications).
3. V.M. Endang S.P. Rahayu. *Effect of Brisk Walking Exercise on Blood Pressure in Hypertensive Patients*. Health Polytechnic Ministry of Health Denpasar, Indonesia. 2022;Vol 15, No (Brisk Walking Exercise, Blood Pressure, Hypertension).
4. Niasty Lasmy Zaen, Fitri Sinaga. *The Effect of the "Brisk Walking Exercise" Method on Reducing Blood Pressure in Hypertension Patients at the Elderly Social Services Unit in Kisaran Rantau Prapat in 2020*. J Midwifery Imelda. 2020;6(1):32–9.
5. SMS & IABTI. *Prevention And Risk Factors Of Degree 2 Hypertension In The Working Area Of The Poasia Health Center, Kendari City*. J Med. 2021;(Prevention of hypertension in Bangladesh).
6. Rachmatullah R. *The Effect of Brisk Walking Exercise on Reducing Blood Pressure: A Systematic Review*. Faletahan Heal J. 2022;9(Vol 9 N0 01 (2022) Faletahan Health Journal March 2022):100–10.
7. Harsismanto J, Juli Andri, Tirta Dwi Payana, Muhammad Bagus Andrianto AS. *Sleep Quality Is Related To Changes In Blood Pressure In Hypertension Patients*. J Chem Inf Model. 2020;53(9):1689–99.
8. RD. Halim AS. *Retrospective Study Of Lifestyle And Incident Of Hypertension In The Productive Age*. J Nurs Public Heal. 2022;Vol 10 (Hypertension).
9. Andini R, Avianty I, Nasution A. *Factors Associated with the Incident of Hypertension in Housewives at the Gang Aut Community Health Center, Paledang Village, Central Bogor District, Bogor City in 2018*. Promoter. 2019;2(1):59.
10. Wulandari S, Hardy FR, Karima UQ, Maharani R. *Determinants of Hypertension in Public Transport Drivers Jonggol-Cileungsi, Bogor Regency (Determinants of Hypertension Among Public Transport Drivers Jonggol-Cileungsi In Bogor Regency)*. National Public Health Semin 2020. 2020;1–17.
11. Masadah M, Wiantari DA, Sulaeman R. *The Effect of Brisk Walking Exercise on Changes in Blood Pressure in Hypertension Sufferers*. J Integrated Nursing (Integrated Nursing Journal). 2021;3(2):73.
12. Agustina EN, Dewi HK, Muslim I, Giri I. *on The Relationship Of Self Awareness With Stroke Complication Prevention Behavior In Indonesia at Ciawi Regional Hospital*. J Ilm Wijaya. 2023;15.
13. Rahayu ER. *Relationship between personality type and degree of hypertension*. Wijaya Science. 2022;14(1):57–70.
14. Hendriati, Saasa, Amirudin R. *The Effect of Brisk Walking Exercise on Reducing Blood Pressure in Hypertension Patients: Literature Review*. Pros Semin Inf Health Nas. 2022;1(1):296–302.
15. Apriyani Puji Hastuti.M.Kep. *Hypertension*. Published by P. I Made Ratih R MP, editor. Indonesia: Lakeisha Publishers; 2020. 96 p.