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Foot Physical Activity Can Reduce Blood Pressure In Hypertension To Eldery

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***Abstract*—Hypertension is a systolic blood pressure of 140 mmHg or more and a diastolic blood pressure of 90 mmHg or more. As the elderly get older there will be physical changes in the cardiovascular system, namely the heart valves are thickened and stiff, the ability to pump blood decreases (decreased contraction and volume), decreased elasticity of blood vessels, and increased resistance of peripheral blood vessels, so that blood pressure increases and causes hypertension in the elderly. Hypertension can be overcome with pharmacological and non-pharmacological therapies, one example of non-pharmacological therapy, namely physical activity on foot, physical activity on foot is a routine activity that uses the power of the leg muscles to perform movements alternately, for 30 minutes per day. Objective: to determine the effect of physical activity on foot for the elderly with hypertension to reduce blood pressure. The method in this research is quantitative with research design *pre-experimental* with *one group pre-test and post-test design*. The sample of this study was 18 elderly with hypertension by observing the research subjects. Blood pressure measurements were measured with a sphygnomater and stethoscope and then recorded before and after physical activity on foot. Measurement of systolic and diastolic blood pressure before walking physical activity was 140/90 mmHg and 150/100 mmHg, while systolic and diastolic blood pressure after walking was 120/80 mmHg and 140/90 mmHg. The conclusion of this study is that physical activity on foot can lower blood pressure and can be used as a non-pharmacological therapy for elderly patients with hypertension.**

Keywords—hypertension, physical activity on foot, decrease in blood pressure

I. INTRODUCTION

Hypertension can be defined as persistent blood pressure with systolic blood pressure above 140 mmHg and diastolic blood pressure above 90 mmHg. In the elderly population, hypertension is defined as systolic blood pressure ≥160 mmHg, and diastolic blood pressure ≥90 mmHg Brunner and Sudarth (2001) as quoted by Aspiani [1]. Patients with high systolic pressure have a 2.5 times higher risk of death than patients with high diastolic pressure. This is because when the systolic pressure is high, blood flow throughout the body including vital organs is also disrupted [2].

According to WHO, the elderly (elderly) are a population group aged 60 years or more, globally in 2013 the proportion of the population over 60 years of age was 11.7% of the total world population, and it is estimated that this number will continue to increase along with an increase in life expectancy, WHO data shows that in 2000 the life expectancy of people in the world was 66 years, in 2012 it increased to 70 years and in 2013 to 71 years, the proportion of elderly people in Indonesia also increased every year, WHO data in 2009 shows that the elderly amounted to 7.49% of the total population, in 2011 it became 7.69% and in 2013 the proportion of elderly people was 8.1% of the total population (WHO, 2015).

Hypertension is a disease whose cases can increase in both urban and rural communities. The occurrence of hypertension in the elderly is influenced by lifestyle, such as diet, smoking and physical activity [3]. This is in line with research [4] that there is a relationship between physical activity and the incidence of hypertension, the more active the physical activity, the more normal blood pressure is in both hypertension *systolic* and *diastolic*. Research [3] found that there are differences in data between before and after low intensity walking training in the elderly group in Rembang Regency. These results indicate that walking has a fairly good benefit in increasing the ability of physical fitness for the elderly, there are many positive notes about the benefits of walking, especially for the elderly, including reducing the risk of stroke, diabetes, osteoporosis, hypertension and respiratory system diseases.

Based on the results of interviews with health workers, he said that usually patients diagnosed with hypertension are only given blood pressure checks and given *Amlodipine is* to lower blood pressure. They said the signs of hypertension symptoms were dizziness, headache, sore neck, blurred vision, they also said that if the signs and symptoms of hypertension appeared, they only took drugs from the Puskesmas for hypertension relief, if the signs and symptoms had disappeared they would stop taking the drugs. Hypertension, they rarely have physical activity, only take drugs if signs and symptoms of hypertension appear, they do not know if there is a way to treat hypertension other than taking medication (pharmacological), namely by means of non-pharmacological therapy that is easy and in expensive, by physical activity on foot.

II. METHOD

The research instruments used in this study were: 1) Sphygmomanometer, 2) Stethoscope, 3) Observation sheet, and 4) Stopwatch / Clock. Respondents in this study were 18 elderly people with the following inclusion criteria: 1) Elderly suffering from mild hypertension (140-159 mmHg)

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or moderate hypertension (160-179 mmHg), 2) Elderly age (60 years or more), 3) Compos mentis awareness, and 4) Willing to be a respondent. As for the exclusion criteria: elderly who have complications of other diseases (coronary heart disease, *stroke*, and *acute myocardial infarction, parenchymal renal*, ureter or bladder obstruction, neurological diseases, such as increased intracranial pressure), elderly with respiratory problems, musculoskeletal system disorders, and hypertensive patients who actively smoke.

Assessment for respondents with:

1. Normal: systolic <120 mmHg, and diastolic <80 mmHg.
2. Normal high: systolic 130-139 mmHg, and diastolic 85-89 mmHg
3. Stage I hypertension (Mild hypertension): systolic 140-159 mmHg, and diastolic 90-99 mmHg.
4. Stage II hypertension (moderate hypertension): 160-179 mmHg systolic, and 100-109 mmHg diastolic
5. Stage III hypertension (severe hypertension): systolic> 180 mmHg, and diastolic> 110 mmHg.

III. RESULT

A. Univariat Analysis

Respondent age

Table 1 Age of responden

Age	Number	Percentage (%)
60-62 year	13	72.2
63-65 year	5	27.8
Total	18	100

The above table shows respondent mostly between the ages of 60-62 years by 72%, while respondents aged 63-65 years were 5%.

Gender

Table 2 gender

Gender	Number	Percentage (%)
Female	18	100
Total	18	100

The data table shows all respondents are female (100%).

B. Bivariat Analysis

1. Blood pressure of respondents before doing walking activities

Table 3 Distribution of respondents before being given walking activities

Blood preasure Pre-test	Number	Percentage (%)
Normal	2	11,2
High Normal	4	22,2
Mild hypertension	8	44,4
Moderate hypertension	4	22,2
Severe hypertension	0	0
Normal	2	11,2
Jumlah	18	100,0

Table above shows that the respondent's blood pressure before being given walking activity most of them had blood pressure in the category of mild or grade 1 hypertension, namely 44.4% as many as 8 respondents.

2. Blood pressure of respondents after doing walking activities

Table 4 Distribution of respondents after being given walking activity

Blood preasure Pre test	Number	Percentage (%)
Normal	5	27,7
High Normal	10	55,6
Mild hypertension	3	16,7
Moderate hypertension		
Severe hypertension		
Total	18	100,0

Based on the table above, it is known that the respondent's blood pressure after being given walking activity is mostly normal high, namely as many as 10 respondents with 55.6%.

C. Bivariat Analysis

Test the effect of walking activity to lower blood pressure in the elderly with hypertension using test *Wilcoxon.*

Table 5 Test Results Effect of walking activity to reduce blood pressure in the elderly with hypertension

Blood pressure	N	Z	p
Pre-test Blood pressure	18	-4.001	0,000
Post-test Blood pressure	18	-3.834	0,000

Table shows the value of Z = -4.001 with p = 0.000 (p < 0.05) for the blood pressure before the pre-test, and the Z value = -3.834 with p = 0.000, (p <0.05) for the post-test blood pressure, so it can be concluded that there is an effect of physical walking on lowering blood pressure in the elderly. hypertension.

D. Discussion

1. The results of measuring blood pressure before physical activity foot.

Based on table 3, it shows that most of the respondents showed abnormally high blood pressure. Hypertension is a symptom of an increase in blood pressure which causes the supply of oxygen and nutrients carried by blood to be blocked to the tissues that need it. Patients with high blood pressure are said to be high if the systolic pressure reaches 140 mmHg or more, while the diastolic pressure reaches 90 mmHg or more [2].

There are various factors that can cause a person to experience hypertension, namely heredity, age, salt, cholesterol, obesity, stress, smoking, caffeine, alcohol, lack of exercise [5]. In addition, hypertension occurs due to increasing age and the aging process, increasing collagen fibers in blood vessels and arteriolar walls so that the vessel walls harden. With reduced elasticity, the area affected by systolic pressure narrows so that the average blood pressure increases.

2. The results of measuring blood pressure after physical activity on foot

After being given treatment for 2 consecutive weeks, the results of blood pressure after being given walking activity indicated that most respondents showed significant results, namely with the normal high category of 10 respondents. This result is supported by Surbakti's research [6] at Dolok Sanggul General Hospital, which shows the effect of 30 minutes of walking exercise on a decrease in

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systolic and diastolic blood pressure. This is because physical activity on foot can accelerate blood circulation to take, circulate and use oxygen and increase the elasticity of blood vessels and the heart will work normally, so that the purpose of applying physical activity on foot in research is to assist in controlling the incidence of hypertension.

When a person gets old, his bones will be demineralized and will break easily, his lungs will experience changes such as emphysema, and the cardiovascular system will decline. Based on the research of Surbakti [6], it is explained that by doing physical activity on foot will slow down the demineralization process, the lung capacity is better, the cardiovascular system will function optimally.

IV. CONCLUSION

Based on the results of research and discussion, the majority of blood pressure in the elderly before being given walking activity is mild hypertension, while blood pressure in the elderly after being given walking activity is normally high. So it can be concluded that there is an effect of physical activity on blood pressure in analyzes with hypertension

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