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# Analysis of the Effect of Hypertension Gymnastics on Lowering Blood Pressure in Hypertension Patients in the Tapungaya Health Center Work Area

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### ABSTRACT

**Introduction:** WHO states that hypertension has attacked 22% of the world's population. While the number of hypertensions in Southeast Sulawesi itself reached 26.53% or 314,454. One of the non-pharmacological treatments for hypertension is hypertension exercise and the DASH Diet (Dietary Approaches to Stop Hypertension) is a diet pattern aimed at lowering blood pressure by limiting salt intake, saturated fat, and increasing food intake that contains a lot of potassium, calcium, magnesium and high-fiber foods. This study is to analyze the Effect of Hypertension Exercise on Lowering Blood Pressure in Hypertension Patients in the Tapungaya Health Center Work Area.

**Method:** This type of research is quantitative with an experimental approach with a pretest-posttest design. The research sample was 284 people using a simple random sampling technique. The data collection tool used a blood measurement observation sheet. The statistical test used was the Paired Sample T-Test.

**Result:** Obtained Results before hypertension exercise treatment on decreasing systolic blood pressure average 148 after treatment average blood pressure 134 mmHg. And the results before treatment diastolic blood pressure average 91 and 96 mmHg after treatment average mmHg. Based on the T-test obtained ( $P$  value = 0.000  $<$  alpha = 0.05). It can be concluded that there is a significant effect between hypertension exercise on decreasing blood pressure.

**Conclusion:** There is an effect of hypertension exercise therapy to lower blood pressure in hypertension sufferers. It is expected that hypertension sufferers can continue hypertension exercise to lower blood pressure.

### Introduction

Non-communicable diseases or commonly referred to as degenerative diseases, which occur

due to decreased organ function, non-communicable diseases are one of the public health problems due to high levels of morbidity

and mortality globally. This type of disease develops slowly and occurs over a long period of time.<sup>[1]</sup> Non-communicable diseases are the leading cause of death globally, according to World Health Organization data, of the 57 million deaths that occurred in 2018, 40 million or around 70% of the 57 million deaths were caused by non-communicable diseases. The highest NCD deaths were caused by cardiovascular disease, which was 39%. Cardiovascular disease is a disease caused by impaired heart and blood vessel function such as CHD, Heart Failure, Hypertension and Stroke.<sup>[2]</sup>

World Health Organization data states that hypertension is the number 1 cause of death in the world, hypertension has killed 9.4 million people in the world each year. WHO 2018 noted that around 972 million people or 26.4% of the world's population experienced hypertension and increased in 2019 to 1.5 billion people. and it is estimated that the number of people with hypertension will continue to increase along with the increasing population. In 2025, it is projected that around 29% of the world's population will suffer from hypertension.<sup>[3]</sup>

According to the Joint National Committee on Prevention Detection, Evaluation, and Treatment of High Blood Pressure VIII/ JNC 2018 hypertension is a condition where systolic blood pressure is  $\leq 140$  mmHg and diastolic pressure is 90 mmHg. Hypertension is a disorder that occurs in the blood vessels that can cause the supply of oxygen and nutrients carried by the blood to be blocked to the body's tissues that need it. If left untreated, this disease can interfere with organ function including vital organs such as the heart and kidneys.<sup>[4]</sup>

Basic Health Research noted that there were 23.7% of 1.7 million deaths due to hypertension in Indonesia. The prevalence of hypertension in Indonesia obtained through blood pressure measurements, in the population aged  $\geq 18$  years was 34.1%, the highest in South Kalimantan (44.1%), while the lowest was in Papua (22.2%). For the prevalence, Southeast Sulawesi province

ranks 18th out of 34 provinces with a prevalence of hypertension reaching 29.8%.<sup>[5]</sup>

The Southeast Sulawesi Provincial Health Office noted that the prevalence of hypertension increases every year. In the period 2009-2013, the prevalence of hypertension in Southeast Sulawesi was 22.5%, significantly increasing in the period 2014-2018 by 29.7%, then increasing in 2019-2021 by 61.57%.

Based on data from the Southeast Sulawesi Provincial Health Service in 2021, hypertension cases ranked second out of the 10 highest diseases in Southeast Sulawesi, amounting to 314,454 people from 17 districts/cities in Southeast Sulawesi. The highest number of sufferers are in Muna district with a percentage of cases (14.30%), Wakatobi (11.12%), South Konawe (9.46%), North Konawe (7.11%), Central Buton (7.03%), Konawe Islands (7.02%), Konawe (6.99%), West Muna (6.96%), North Kolaka (6.89%), East Kolaka (6.85%), Kolaka (6.33%), North Buton 5.78%), Buton (4.95%) Muna (4.87%) Kendari City (3.45%), South Buton (3.42%), Bombana 1.24%), and hypertension with a prevalence with a small number of hypertension, namely Bau-bau City (0.97%).<sup>[6]</sup>

One of the health centers in North Konawe Regency, namely the Tapunggaya Health Center located in Tapunggaya Village, Molawe District, ranks first with the number of hypertension cases of 1089 cases from 22 health centers in North Konawe Regency, the Tapunggaya Health Center has hypertension cases that continue to increase every year, according to data from the Tapunggaya Health Center, in 2019 there were 667 cases, increasing in 2020 by 895 cases and in 2021 increasing to 1089 cases. And is the first order of the 10 biggest diseases in the Tapunggaya Health Center.

Looking at the location of the residence of people suffering from hypertension at the Tapunggaya Health Center, the community is in a coastal area where the majority of their profession is as fishermen with food sources originating from the sea, so that the Tapunggaya community tends

to consume foods that contain high levels of salt such as salted fish. In addition, people rarely do physical activity and take antihypertensive drugs irregularly. These drugs are only consumed when they experience unbearable headaches.<sup>[7]</sup>

Various risk factors have been associated with hypertension, including age, family history of hypertension, gender, education, obesity, lack of physical activity, unhealthy diet, smoking, alcohol consumption, mental stress, and caffeine consumption. The highest risk factors for non-communicable diseases Hypertension are lack of consumption of vegetables and fruit (93.5%), smoking (36.3%), central obesity (26.6%), and lack of physical activity (26.1%).<sup>[5]</sup>

Based on a preliminary survey conducted on several respondents at the Tapunggaya Health Center after interviews, information was obtained that patients with a history of unhealthy eating patterns were 5 people (55.5%), out of 10 respondents, and 7 people (77.7%) out of 10 respondents had a history of lack of physical activity, in addition, information was also obtained from the head of the Tapunggaya Health Center where the highest cases of hypertension occurred due to dietary factors and lack of physical activity.

From the explanation above, the researcher is interested in conducting research on Hypertension Patients in the Tapunggaya Health Center Work Area.

## Method

This type of research is quantitative with an experimental approach with a pretest-posttest design. The population in this study were all hypertension sufferers in the Tapunggaya Health Center Working Area totaling 1.089 sufferers and the research sample was 284 people using a simple random sampling technique. The data collection tool used a blood measurement observation sheet. The statistical test used was the Paired Sample T-Test.

## Result

**Table 1** showed that 124 samples experienced a decrease in systolic blood pressure after hypertension exercise, and there was not a single sample or 0 that did not experience a decrease in blood pressure, the paired sample T-test statistical test showed a p-value = 0.000 for blood pressure values so that the p-value <0.05. This means that there is a difference in blood pressure values before and after being given hypertension exercise intervention at the Tapunggaya Health Center Service Technical Implementation Unit, this means that there is an effect of hypertension exercise on reducing blood pressure in hypertensive patients.

**Table 2** showed that 124 samples experienced a decrease in diastolic blood pressure values after hypertension exercise, and there was not a single sample or 0 that did not experience a decrease in blood pressure values, the paired sample T-test statistical test showed a p-value = 0.000 for blood pressure values so that the p-value <0.05. This means that there is a difference in diastolic blood pressure values before and after hypertension exercise intervention was given at the Tapunggaya Health Center Service Technical Implementation Unit, this means that there is an effect of hypertension exercise on reducing blood pressure in hypertensive patients.

Based on the results of table 5.5 and table 5.6, the conclusion that can be drawn is that there is an effect of hypertension exercise on changes in blood pressure in hypertensive patients for both systolic and diastolic scores. In accordance with the results of the paired sample T-Test, the results of the study prove that the systolic results are p-value = 0.000 < $\alpha$ =0.05 and the results of the paired sample T-Test from diastolic p-value = 0.000 < $\alpha$ =0.05 so that the comparison of the results of systole and diastole can be concluded that H<sub>0</sub> is rejected and H<sub>1</sub> is accepted, which means that there is an effect of hypertension exercise therapy on reducing blood pressure in hypertensive patients at the Tapunggaeya Health Center.

**Table 1.**  
**Analysis of Changes in Systolic Blood Pressure Values Before and After Doing Hypertension Exercises**

Paired 1		Paired Differences95% Confidence Interval of the Difference	T	df	Sig. (2-tailed)
		upper			
	systolic BP value before HT exercise - systolic BP value after HT exercise	17.05003	28,301	123	,000

**Table 2.**  
**Analysis of Changes in Diastolic Blood Pressure Values Before and After Doing Hypertension Exercises**

Paired 1		Paired Differences95% Confidence Interval of the Difference	T	Df	Sig. (2-tailed)
		upper			
	systolic BP value before HT exercise - systolic BP value after HT exercise	10,11706	16,904	138	,000

**Discussion**

**The effect of the relationship between blood pressure values before and after hypertension exercise**

Before the hypertension exercise (pre-test), 124 respondents experienced hypertension. This was caused by several different factors in each respondent. Some were caused by age, family history, heredity. Respondents said they liked to consume fatty foods, coconut milk, often experienced stress and lacked activity. So that this can trigger an increase in blood pressure. With the results of the average value of pre-test systolic blood pressure of 148 mmHg and the average value of pre-test diastolic blood pressure of 91 mmHg. Then hypertension exercise was carried out with light intensity, the frequency of exercise was done 2 times a week for approximately 15 minutes, after the hypertension exercise (post-test)

showed 124 respondents experienced a decrease in blood pressure. With an average value of systolic blood pressure of 132 mmHg and diastolic 83 mmHg.

Hypertension exercise can lower blood pressure because when exercising the heart is able to work optimally, where exercise is able to increase the energy needs of cells, tissues and organs of the body, which as a result can increase venous return flow, causing a volume that will directly increase cardiac output, causing arterial blood pressure to increase.<sup>[8]</sup> After the arterial blood pressure increases, it will be able to reduce the activity of the sympathetic nerves, after which it will cause the heart rate to decrease, the volume to decrease, the arteriole venous vasodilation, because this decrease results in a decrease in cardiac output and a decrease in total peripheral resistance, resulting in a decrease in blood pressure. Hypertension gymnastics is a breathing

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exercise combined with movement sports. Which combines body movements with breathing techniques. The movements in gymnastics are carried out regularly and harmoniously.

There are several hypertension exercise movements consisting of warm-up exercises, core exercises, and cool-down exercises, where these warm-up movements are carried out before entering the core movements with the aim of preparing various body systems before entering the actual exercise.<sup>[9]</sup>The purpose of this exercise is to raise body temperature, increase heart rate approaching exercise intensity. In addition, warming up is necessary to reduce the possibility of injury due to exercise. The warm-up period is usually approximately 5 minutes. For core movements, it is usually a movement that has been active by following a certain flow. This movement aims to strengthen the muscles of the body such as the hands, stomach, hips and also train body movement coordination. This movement is done for approximately 10 minutes or adjusted to the goals and exercises performed last cooling movement The implementation of this movement is a gradual decrease in movement from high intensity to low intensity). This movement aims to restore the body's condition to before training and return blood to the heart for reoxygenation so as to prevent blood pooling in the leg muscles and hands. This movement is done for approximately 5 minutes.

Hypertension gymnastics that have been done for approximately 15 minutes can have an effect on respondents who experience abnormal blood pressure, namely respondents said that after doing hypertension gymnastics the body felt more relaxed and lighter, the decrease in blood pressure experienced by respondents varied depending on the conditions experienced by the respondents, such as the presence of other accompanying diseases, inappropriate movements when doing gymnastics. Respondents said that their blood pressure decreased and some even returned to normal after doing hypertension gymnastics.

The results of the study conducted; Hypertension gymnastics has an effect on changes in blood pressure. This is proven by the results of the study several respondents said that after doing hypertension gymnastics blood pressure decreased where some became normal, and some experienced a decrease in blood pressure did not reach normal, this depends on the condition and response of the respondents to the gymnastics actions carried out by the researcher. And after being observed the respondents looked more relaxed, and calmer after doing the hypertension gymnastics. The more often you move in doing gymnastics, the faster the process of lowering blood pressure.

It can be concluded that the average value of the respondent's actions before (pre-test) and after (post-test) hypertension gymnastics was 124 with a significance of 0.00. Based on the T-test, it was obtained ( $p\text{-value} = 0.00 < \alpha = 0.05$ ), which means that  $H_0$  is rejected and  $H_1$  is accepted, namely there is an effect of hypertension gymnastics on reducing blood pressure with hypertension. In line with study conducted by Hernawan with the results that there is an effect of elderly hypertension gymnastics on reducing blood pressure in the elderly at the Panti Werda.<sup>[10]</sup>

## Conclusion

There is an influence of blood pressure values before and after the intervention in the form of a DASH diet with a  $p\text{-value} = 0.000$ , which means that there is a relationship between the difference in blood pressure before and after the DASH diet intervention is given to hypertensive patients at the Service Technical Implementation Unit Tapunggaya Health Center, North Konawe Regency. It is hoped that hypertensive patients can continue hypertension exercise to lower blood pressure.

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