

The Effect of Ergonomic Exercise on Blood Pressure Reduction in Hypertensive Patients at the South Tinggede Health Center in the Tinggede Community Health Center Working Area

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ABSTRACT

Background & Objective : Hypertension is one of the most common non-communicable diseases in society and is known as the “silent killer” because its symptoms often go unnoticed. Data shows that the prevalence of hypertension in Central Sulawesi is quite high. Non-pharmacological management such as ergonomic exercises is a potential alternative in lowering the blood pressure of patients with hypertension. This study aims to analyze the effect of ergonomic exercises on lowering blood pressure in hypertensive patients at the Tinggede Selatan Health Center in the Tinggede Public Health Center working area. **Method:** This study used a quantitative approach with a pre-experimental one-group pretest-posttest design. The sample consisted of 35 people with hypertension, selected using total sampling technique. The intervention, which was ergonomic exercises, was given twice a week for two weeks.. **Result:** Before the intervention, 21 respondents (60.0%) were in stage 1 hypertension, and after the intervention, there was a significant decrease in blood pressure in the prehypertension category in 21 respondents (60.0%). Statistical testing using the Wilcoxon test yielded a p-value of 0.000 (< 0.05). **Conclusion:** Ergonomic exercises have been proven to have a significant effect in lowering blood pressure in people with hypertension.

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Introduction

Non-communicable diseases can affect people of all ages and in all countries, and are the leading cause of annual deaths. These diseases develop slowly and last a long time, and cannot be transmitted from one person to another. We encounter various non-communicable diseases in our daily lives, such as diabetes mellitus, high cholesterol, Alzheimer's, arthritis, epilepsy, various cardiovascular diseases, hemophilia, and hypertension (Lukitaningtyas and Cahyono, 2023). Hypertension is often referred to as a silent killer because sometimes sufferers are unaware of the symptoms even though they have had hypertension for a long time (Ahmil et al., 2023).

According to the latest data from the World Health Organization (WHO 2023), 1.28 billion adults worldwide aged 30 to 79 suffer from hypertension, with the majority, two-thirds, living in low- and middle-income countries. The WHO reports that 46% of adults with hypertension are unaware that they have the disease, and 42% of those being treated for hypertension are unaware that they have the disease. Only 21% of those affected by hypertension, or about 1 in 5 people, are able to control their blood pressure (WHO, 2023).

Based on data obtained from the Central Sulawesi Provincial Health Office in 2023, the number of hypertension cases in people aged ≥ 15 years reached 573,620. In Central Sulawesi, there are several regions with different numbers of hypertension cases, including Banggai Islands with 27,110 cases, Banggai with 17,762 cases, Morowali with 41,895 cases, Poso with 64,176 cases, Donggala with 69,809 cases, Toli-toli with 55,211 cases, Buol with 37,552 cases, Parigi Moutong with 86,260 cases, Tojo Una - Una there are 35,534 cases, in Banggai Laut there are 16,329 cases, in North Morowali there are 2,168 cases, in Palu City there are 69,259 cases, and in Sigi there are 50,555 cases. To improve the health status of the community in Central Sulawesi, strategic steps are needed in the prevention and control of hypertension, given that the data shows a high prevalence of hypertension in various locations (Central Sulawesi Health Office, 2023).

The management of hypertension or lowering blood pressure can be done through pharmacological and non-pharmacological approaches. Non-pharmacological approaches involve physical activities such as exercise, including gymnastics. Various types of gymnastics have been used as therapy to lower blood pressure, such as tera gymnastics, yoga, Kegel exercises, and one of them is ergonomic gymnastics. Ergonomic gymnastics is inspired by the movements of prayer and has a self-regulating function through prayer. It includes heart, verbal, and body movements. The movements of ergonomic gymnastics are adapted to the principles of God's creation as reflected in the movements of prayer. Therefore, ergonomic gymnastics is considered capable of opening, purifying, and activating the entire body system (Jumari and Putri, 2021).

The movements in this exercise follow principles inspired by the movements of prayer, making it easier for the elderly to perform. Wratsongko MM is the creator of ergonomic exercise from Indonesia. This exercise is beneficial for preventing and

overcoming various types of diseases in the field of fitness and health, as well as for achieving optimal results. This exercise should be done regularly, at least 2-3 times a week for approximately 30 minutes if all movements are performed correctly (Haripuddin and Andi Nuddin, 2021).

Based on data from the Tinggede Community Health Center (UPTD Puskesmas Tinggede), 872 people suffer from hypertension. This data was obtained from 8 integrated health service posts (posyandu), using information collection methods that included home visits and reports from hypertension patients to the community health center. Meanwhile, the number of active hypertension patients at the South Tinggede posyandu is 35 people. Interview results regarding hypertension management at the South Tinggede Posyandu show that the approach taken still focuses on medical treatment. This approach is not without problems, as interviews with 4 hypertensive patients revealed that they often forget to take their medication, while 5 others said they lacked physical activity. Posyandu cadres said that although the South Tinggede Posyandu had implemented hypertension exercises, these activities had not achieved optimal results because hypertensive patients were bored with the existing exercises. Based on this explanation, the researcher was interested in conducting a study entitled "The Effect of Ergonomic Exercise on Blood Pressure Reduction in Hypertension Patients at the Tinggede Selatan Health Center in the Tinggede Community Health Center Working Area."

Objective

Analyzing the effect of ergonomic exercises on lowering blood pressure in hypertensive patients at the Tinggede Selatan Health Center in the Tinggede Community Health Center working area.

Method

This study used a quantitative approach with a pre-experimental one-group pretest-posttest design. The study sample consisted of 35 hypertensive patients selected using total sampling technique. The intervention, which was ergonomic exercise, was administered twice a week for two weeks.

Results

TABEL 1 Frequency Distribution of Respondents Based on Age and Gender of Hypertension Patients (f=35)

Characteristics	Frequency(f)	Percentage(%)
Age		
46 - 55 years old	14	40,0
56 - 65 years old	16	45,7
>65 years old	5	14,3
Gender		
Male	12	34,3
Female	23	65,7

Table 1 above shows that the largest number of respondents were aged 56–65 years, totaling 16 respondents with a percentage of 45.7%. Meanwhile, the most common gender characteristic among respondents with hypertension was female, totaling 23 people with a percentage of 65.7%.

TABLE 2 Blood Pressure Frequency Distribution of Hypertension Patients before Performing Ergonomic Exercises at the South Tinggede Health Center in the Tinggede Community Health Center Working Area (f=35)^a

Characteristics	Frequency(f)	Percentage(%)
Normal	0	0
Prehypertension	3	8,6
Stage 1 Hypertension	21	60,0
Stage 2 Hypertension	11	31,4

^a total sample. Source: Primary Data (2025).

Table 2 above shows that of the 35 respondents, 21 people (60.0%) had stage 1 hypertension.

TABEL 3 Frequency Distribution of Blood Pressure in Hypertensive Patients after Performing Ergonomic Exercises at the South Tinggede Health Center in the Tinggede Community Health Center Working Area (f=35)^a

Characteristics	Frequency(f)	Percentage(%)
Normal	4	11,4
Prehypertension	21	60,0
Stage 1 Hypertension	10	28,6
Stage 2 Hypertension	0	0

^a total sample. Source: Primary Data (2025).

Table 3 above shows that of the 35 respondents, 21 respondents (60.0%) had prehypertension or hypertension.

TABLE 4 Blood pressure frequency distribution of hypertensive patients after performing ergonomic exercises at the South Tinggede Health Center in the Tinggede Community Health Center Working Area (f=35)^a

Category	Rank	(n)	Mank Rank	Z	p value
Blood Pressure After - Blood Pressure Before Ergonomic Exercise	Negative Ranks	35	18,00	-5,771	
	Positive Ranks	0	0,000	0,000	0,000 ^b
	Ties	0			

^a total sample size. ^bWilcoxon test, significant if $p < 0.05$. Source: Primary Data (2025).

Based on Table 4, the Wilcoxon test results show that Negative Ranks are the number of respondents with lower blood pressure after treatment than before treatment, with a total of 35 respondents. Positive Ranks are those with increased

blood pressure after treatment, and Ties are those with unchanged blood pressure, each with a value of 0, so that all respondents experienced a decrease in blood pressure after doing ergonomic exercises. The Mean Rank or average rank for the group that experienced a decrease was 18.00, and the Z-score of -5.771 was the result of converting the Wilcoxon test into a standard normal distribution. Meanwhile, the p-value indicates the statistical significance probability of the difference that occurred. A p-value of 0.000 (< 0.05) indicates that the difference in blood pressure before and after treatment is statistically significant, which means that ergonomic exercises are effective in lowering the blood pressure of respondents.

Discussion

The research conducted at Posyandu Tinggede Selatan, under the working area of Puskesmas Tinggede, showed that the blood pressure of hypertensive patients decreased after being given ergonomic exercise. The Wilcoxon test results indicated 35 negative ranks (n), meaning that 35 hypertensive patients experienced a decrease in blood pressure, with a mean rank of 18.00 and a p-value of 0.000. Thus, it can be concluded that ergonomic exercise has a significant effect in reducing blood pressure among hypertensive patients at Posyandu Tinggede Selatan, Puskesmas Tinggede.

This finding is in line with the study by Arafah et al. (2024), which proved that ergonomic exercise effectively lowers blood pressure in pre-elderly patients with hypertension. Before the intervention, most respondents experienced mild hypertension; however, after performing ergonomic exercise, the majority experienced a decrease in blood pressure to the normal category. Data analysis using the Wilcoxon signed rank test showed $p=0.000$ ($p<0.05$), indicating a significant effect of ergonomic exercise on lowering blood pressure in pre-elderly individuals in the working area of Puskesmas Kalisat.

Hypertension is a medical condition characterized by a persistent increase in blood pressure in the blood vessels. This condition is based on two phases of each heartbeat: the diastolic phase, which occurs when blood returns to the heart, and the systolic phase, which occurs when blood is pumped out of the heart with a force of 140 mmHg. If left untreated, hypertension can worsen and affect the function of other organs, especially the kidneys and heart, since the heart has to work harder to pump blood to meet the body's oxygen and nutrient needs (Andari et al., 2020).

According to Asbahani (2023), fatigue and headaches are the most common symptoms of hypertension. In fact, most patients seeking medical help present with these as their primary complaints. Some common signs of high blood pressure include headaches, weakness, fatigue, shortness of breath, restlessness, nausea, vomiting, and decreased consciousness.

The research conducted at Posyandu Tinggede Selatan, as presented in Table 4.2, showed that among 35 respondents, 21 people (60.0%) had stage 1 hypertension, 11 people (31.4%) had stage 2 hypertension, and 3 people (8.6%) were pre-hypertensive, while none had normal blood pressure. The researcher assumes that abnormal blood

pressure can cause damage to blood vessels. Therefore, hypertensive patients are advised to monitor their blood pressure regularly and adopt a healthy lifestyle, one of which is performing exercise.

This finding is supported by the study of Nurhaeni, Aimatun Nisa, and Marisa (2022), which explained that blood pressure is the force exerted by blood against the walls of blood vessels, resulting from the pumping action of the heart throughout the body. The level of blood pressure varies depending on the condition of blood vessels and heart rate. In hypertension, blood pressure increases to 140/90 mmHg due to the excessive force of blood being pumped through the vessels.

The study conducted at Posyandu Tinggede Selatan (Table 4.1) also showed that among the 35 hypertensive patients, 14 respondents (40.0%) were aged 46–55 years, 16 respondents (45.7%) were aged 56–65 years, and 5 respondents (14.3%) were over 65 years old. The researcher assumes that as age increases, blood vessel elasticity decreases and plaque accumulates in the vessels, thereby reducing kidney function and leading to higher blood pressure. Thus, it is important to prevent and manage hypertension early, especially in the elderly.

This is consistent with the study of Yunus, Aditya, and Eksa (2021), which found that people aged 51–60 years are more prone to disease because organ function begins to decline due to aging.

Furthermore, the research conducted at Posyandu Tinggede Selatan (Table 4.1) revealed that 23 respondents (65.7%) were female and 12 respondents (34.7%) were male. The researcher assumes that women are more likely to experience hypertension than men due to hormonal changes in estrogen during menopause. The decrease in estrogen levels triggers the activation of the sympathetic nervous system, which then stimulates the release of renin and angiotensin enzymes, leading to an increase in blood pressure.

This is in line with the study by Astuti (2021), which reported that most respondents were women (60%) compared to men (40%). Women tend to have higher blood pressure after menopause.

The research conducted at Posyandu Tinggede Selatan also showed that most respondents experienced a decrease in blood pressure after performing ergonomic exercise. Table 4.3 shows that among 35 respondents, 21 people (60.0%) had pre-hypertension, 10 people (28.6%) had stage 1 hypertension, and 4 people (11.4%) had normal blood pressure, while none had stage 2 hypertension. The researcher assumes that ergonomic exercise is an effective method to reduce blood pressure in hypertensive patients. Its movements are simple, take less than 30 minutes, and were performed four times over two weeks in a calm and relaxed state.

This finding is consistent with Ningtias, Yuliza, and Herliana (2023), who stated that ergonomic exercise has benefits in lowering blood pressure. This exercise is a non-pharmacological therapy for hypertension and serves as an effective complementary method in helping control blood pressure among hypertensive patients. There are various types of exercise to lower blood pressure, one of which is ergonomic exercise.

It should be done regularly, at least 2 to 3 times per week, for 20 to 30 minutes. Such activity can stimulate vasodilation or the widening of blood vessels.

Conclusion

There is an Effect of Ergonomic Exercise on Blood Pressure Reduction in Hypertensive Patients at the South Tinggede Health Center in the Tinggede Community Health Center Working Area.

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