



# The Effectiveness of Aerobic Gymnastics Program in Lowering Blood Pressure in Elderly People with Hypertension: A Case Study in Cibungur Village

Fahmi Sidiq<sup>\*</sup>

<sup>1</sup> Pharmacy Study Program, Faculty of Health Sciences, Universitas Perjuangan Tasikmalaya

<sup>\*</sup>Corresponding author email: [fahmisidiq78@gmail.com](mailto:fahmisidiq78@gmail.com)

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## Abstract

This study aims to investigate the effect of aerobic exercise program on lowering blood pressure in elderly people with hypertension in Cibungur Village. The study population consisted of 40 elderly people with certain inclusion criteria who lived in Cibungur Village and had the physical ability to perform gymnastic movements. The sampling technique uses purposive sampling method. Systolic and diastolic blood pressure data were measured before and after the implementation of the hypertensive gymnastics program. The research design used was pre-experimental with one group pre-test and post-test design. Aerobic gymnastics programs involve movements such as High Footsteps, Boxing and Kicking Stances, Side Steps, Sliding Kicks, Skipping Ropes, and Body Stretching and Warm-Up. Gymnastics programs are run in regular sessions supervised by experienced instructors. Blood pressure measurement is done using a sphygmomanometer and stethoscope.

The results showed that aerobic exercise programs produced positive changes in the blood pressure of elderly people with hypertension. There was a decrease in systolic and diastolic blood pressure after participating in the gymnastics program. Data analysis showed a significant impact of gymnastics programs in lowering blood pressure in hypertensive elderly populations.

This research has important implications for efforts to prevent and manage hypertension in the elderly. Aerobic exercise programs can be an effective alternative and can be implemented easily to help lower blood pressure in the elderly population with hypertension. Follow-up studies with larger sample sizes and control groups can provide deeper insights into the benefits and effectiveness of gymnastics programs in the management of hypertension in the elderly.

**Keywords:** aerobic gymnastics, blood pressure, elderly, hypertension

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## 1. Introduction

The lifestyle of modern society, especially in urban areas, is often characterized by a tendency to prefer ready-made foods rich in fat, protein and salt, but low in fiber. This phenomenon, as revealed by Muhammadun (2010), has brought serious consequences to health, including an increased risk of health problems such as hypertension, heart failure, diabetes mellitus, stroke, and kidney disease. In this context, hypertension has become a very significant public health challenge, and was even ranked second out of the ten most commonly treated major diseases in outpatient services in hospitals in 2010, as noted by the Ministry of Health of the Republic of Indonesia (Kemenkes RI, 2012).

Indonesia, as one of the countries with a large population, faces an increasing health burden due to the high prevalence of hypertension. Based on data from Basic Health Research (Riskesdas) in 2018, the prevalence of hypertension in Indonesia reached 34.1%. This figure shows that more than one-third of the Indonesian population has high blood pressure. The proportion of this prevalence varies in different regions, with the highest rate recorded in South Kalimantan (44.1%) and the lowest rate in Papua (22.2%). This illustrates the geographical variation in the spread of hypertension problems in Indonesia. At the national level, hypertension is even ranked second of the ten most common diseases found in outpatients in hospitals.

It is necessary to attribute the prevalence of hypertension to risk factors associated with modern lifestyle. Unhealthy eating habits, especially the consumption of ready-to-eat foods that are high in fat, protein, and salt, but low in fiber, have become one of the main factors contributing to the increase in hypertension rates. Data also shows that lifestyle

changes such as lack of physical activity and high stress also play an important role in the increasing prevalence of hypertension in the community.

To respond to this challenge, it is important for the elderly, who are prone to high blood pressure, to take preventive measures. One approach that can be adopted is the concept of SEHAT, which refers to efforts to balance nutrition, get rid of cigarettes, avoid stress, monitor blood pressure, and exercise regularly. Focus on the last point, namely regular exercise, is very important in efforts to prevent hypertension in the elderly. Various types of physical exercise, such as walking, cycling, swimming, as well as involving household activities, including hypertensive gymnastics, all have the potential to provide positive benefits for the health of the elderly (Maryam et al., 2008).

Hypertensive gymnastics is a form of physical exercise specifically designed to help manage the risk of hypertension by reducing weight and dealing with stress. This gymnastics program combines physical movements that are beneficial for heart and blood vessel health, as well as relaxation techniques that aim to reduce stress levels. The combination of physical activity and relaxation makes hypertension gymnastics a tool that has a special role in dealing with the risk of hypertension.

In the context of general efforts to lose weight, hypertensive gymnastics can help individuals achieve and maintain a healthy weight. Overweight or obesity has a close correlation with an increased risk of hypertension. By involving physical exercise that burns calories and helps build muscle mass, hypertensive gymnastics helps regulate weight, which in turn can reduce stress on the cardiovascular system.

On the other hand, hypertensive gymnastics also shows an important role in managing stress. Chronic stress can trigger an increase in blood pressure, and individuals suffering from hypertension are often at higher risk of feeling the negative effects of stress. In hypertensive gymnastics, relaxation techniques such as deep breathing, meditation, and stretching help calm the nervous system, reduce stress, and ultimately help keep blood pressure within normal limits.

Real evidence of the effectiveness of hypertensive gymnastics can be seen from the results of research conducted by Victor Moniaga et al. in 2013. In this study, they observed elderly participants who participated in a fitness exercise program for three weeks. The results showed significant differences in elderly systolic blood pressure measurements before and after the program. This reduction in systolic blood pressure has positive implications in reducing the risk of hypertension and the potential complications associated with it.

Thus, hypertensive gymnastics is not just an ordinary physical exercise, but also an effective strategy in overcoming the risk of hypertension through two main approaches: weight reduction and stress management. This combination makes hypertension gymnastics a tool that has a special role in maintaining heart and blood vessel health, as well as reducing the risk of hypertension in susceptible individuals.

Observing this situation, this study will focus on Tasikmalaya Regency, which consists of 40 scattered Puskesmas. The 2021 report showed that 596 patients had sought treatment related to hypertension at the Parungponteng Tasikmalaya Health Center. The disease ranks third highest on the list of reported cases, along with dyspeptic diseases and acute respiratory infections (ARI). In the midst of high prevalence and the fact that many patients do not undergo routine care at health centers, attention from health care providers and policymakers is crucial. Effective strategies are needed to meet these challenges and ensure that the elderly get the necessary care and prevention.

Within this framework, this study aims to investigate the effect of hypertensive gymnastics on lowering blood pressure in Cibungur Village, the working area of the Parungponteng Health Center. By understanding the impact of this physical exercise on the health of the elderly, it is hoped that this research can provide valuable insights in overcoming hypertension-related health problems in the region. Furthermore, this research is expected to make a positive contribution in developing a more effective preventive approach for hypertension in the elderly.

## 2. Methodology

This research was conducted in Cibungur Village, which is part of the working area of the Parungponteng Health Center. The study population consisted of elderly people with hypertension in Cibungur Village, with a total number of about 40 people. The sampling technique used is purposive sampling, where samples are selected based on special considerations that fit the inclusion criteria. Inclusion criteria include the elderly who live in Cibungur Village and still have the physical ability to perform gymnastic movements.

The independent variable in this study was the hypertensive gymnastics program, which involved a series of aerobic movements targeted at elderly people with hypertension. The movements in this gymnastics program are designed to involve most of the body's muscles with moderate intensity. While the dependent variable is the blood pressure of the elderly. Blood pressure measurement is done using a sphygmomanometer and stethoscope, with a measurement scale based on a ratio scale.

The tools used in this study include sphygmomanometers, stethoscopes, as well as paper and stationery. Measurement of systolic and diastolic blood pressure was carried out before and after the implementation of the hypertensive gymnastics program in each respondent. Other data taken include respondent numbers, gender, age of the elderly, and blood pressure before and after the gymnastics program.

This study used a quantitative research design with a type of pre-experimental research. The research design adopted is one group pre-test and post-test design, which aims to observe changes in blood pressure before and after the implementation of the hypertensive gymnastics program.

Data collection is carried out through three stages. The first stage involves the preparation of the research site by obtaining the necessary permits. The second stage involves selecting samples according to inclusion criteria as well as explaining to potential respondents the duration and purpose of the study. Respondents willing to participate will be asked to sign informed consent. The third stage is the data collection stage which includes pre-test, intervention (hypertension gymnastics program), and post-test.

The following are examples of aerobic gymnastics movements that we include in the program:

1. High Knees: Participants were asked to stand up straight in a relaxed posture. The movement is performed like running on the spot, while raising the knees as high as possible towards the chest alternately.
2. Boxing Punches and Kicks: Participants stand with their feet shoulder-width apart. The movement is similar to hitting the fist alternating forward, while moving the foot with the kick forward alternately.
3. Side Steps: Participants stand up straight in a relaxed manner. They were asked to step to the left side, then step the right foot to the side and repeat the alternating movements.
4. Slide Kicks: In a standing position with their feet shoulder-width apart, participants slide one leg forward and kick the other leg forward alternately.
5. Jump Rope: This movement mimics jumping rope on the spot, without using the actual rope. Participants jumped with their legs replaced alternately.
6. Body Stretches and Warm-up: Before and after aerobic gymnastics sessions, we incorporate stretching and body warm-up movements to avoid injury. This includes stretching your arms upwards, twisting your waist, and doing other light warm-ups.

The aerobic exercise program is run in regular sessions supervised by experienced instructors. Participants performed the movements described in a supportive and controlled atmosphere. Blood pressure measurements are carried out before and after the implementation of the gymnastics program to monitor changes in blood pressure.

By implementing this aerobic exercise program, this study aims to observe the impact of lowering blood pressure on elderly people with hypertension. Blood pressure measurement data will be analyzed to assess the effectiveness of this program in treating hypertension in the elderly population.

### 3. Results and Discussion

#### 3.1. Characteristics of Respondents

**Table 1.** Age Distribution of Respondents in Research

Age	Number of Respondents	Percentage
51-59 years old	25	62.5%
60-74 years old	15	37.5%
Total	40	100%

In the age distribution table of respondents presented above, there is important information about the age characteristics of study participants. Of the total 40 respondents, 25 people (62.5%) were in the age range between 51 to 59 years, while 15 others (37.5%) were between the ages of 60 and 74 years. The total number of respondents in this study was 40 people.

The importance of observation of age factors in this study is supported by natural phenomena that occur in the elderly. The elderly tend to experience an increase in blood pressure with age. This condition is mostly caused by arteriosclerosis, which is hardening and thickening of the artery walls, especially in the aorta and other major arteries. As a result, these arteries lose flexibility and elasticity, which previously allowed for a smoother adjustment of blood flow from the heart. The impact is the occurrence of uninterrupted blood pressure pulse wave patterns, with higher systolic blood pressure and lower diastolic blood pressure (Wolff, 2008).

Increasing age also affects changes in blood pressure regulation mechanisms. The elderly experience increased peripheral resistance and sympathetic nervous system activity, as well as decreased sensitivity from a blood pressure regulation mechanism known as the baroreceptor reflex. It occurs in old age and tends to contribute to increased blood pressure (Kusmana, 2009).

Thus, an understanding of blood pressure changes associated with age factors becomes important in the context of this study. Further analysis will provide deeper insight into how these factors may interact and impact lowering blood pressure in the elderly population following hypertensive gymnastics programs.

#### 3.2. Gender

In this analysis, we looked at the gender distribution of a total of 40 respondents, who were involved in this study. Based on the data collected, the gender breakdown of respondents is as Table 2.

**Table 2.** Distribution of Respondents in gender

Gender	Number of Respondents	Percentage
Woman	28	70.0%
Man	12	30.0%
Total	40	100.0%

In the results of this study, the data presented in the table above showed that sex participation in this study was dominated by female respondents, with a total of 28 people (70.0%). Meanwhile, male respondents were represented by 12 people (30.0%). The total number of respondents in this study was 40 people.

These data provide an initial overview of the sex composition in the study sample and its relevance to a more in-depth analysis related to potential blood pressure reduction through hypertensive gymnastics programs. Although there is equality in the likelihood of developing hypertension between men and women, there are differences in protective factors related to cardiovascular disease. In women, especially before reaching menopause, the hormone estrogen plays a role in increasing levels of High-Density Lipoprotein (HDL) which has an important role in the prevention of atherosclerosis (Sylvia & Price, 2007).

It is important to note that women, especially in the age range of 45-55 years which is the pre-menopausal period, tend to experience an increase in blood pressure. This is caused by the slow loss of the hormone estrogen which serves as a protector of blood vessels from damage (Maryam, 2008). These findings suggest that gender factors have implications for efforts to lower blood pressure through hypertensive gymnastics programs and need to be considered in further analysis of the impact of such programs.

Here is a table that illustrates the blood pressure data of the elderly before and after hypertension exercise:

**Table 3.** Blood Pressure of the Elderly Before and After Hypertensive Exercise

	Before Hypertensive Gymnastics	After Hypertensive Gymnastics
Systolic Blood Pressure (mmHg)	Minimum: 140	Minimum: 130
	Maximum: 180	Maximum: 140
	Average: 158	Average: 146.88
Diastolic Blood Pressure (mmHg)	Minimum: 80	Minimum: 70
	Maximum: 100	Maximum: 80
	Average: 96	Average: 88.75

The results of this study showed that before the hypertensive gymnastics program, the elderly had blood pressure with a minimum systolic value of 140 mmHg and diastolic of 80 mmHg. The maximum value for systolic blood pressure is 180 mmHg and diastolic is 100 mmHg. The average systolic blood pressure at this stage is 158 mmHg, while the average diastolic blood pressure is 96 mmHg. These values indicate that before the hypertensive gymnastics program, the elderly had mild hypertension.

However, after following the hypertensive gymnastics program, there were positive changes in the blood pressure of the elderly. Minimum systolic blood pressure decreases to 130 mmHg and minimum diastolic blood pressure to 70 mmHg. Meanwhile, maximum systolic blood pressure decreased to 140 mmHg and maximum diastolic blood pressure to 80 mmHg. The average systolic blood pressure after the hypertensive exercise program was about 146.88 mmHg, while the average diastolic blood pressure was about 88.75 mmHg. This change indicates a decrease in blood pressure in the elderly after participating in a hypertensive gymnastics program.

The results also provide insight that hypertension is a disorder in the circulatory system that results in an increase in blood pressure above normal limits. Blood pressure of 140 mmHg is included in the category of mild hypertension, while blood pressure of 180 mmHg is included in the category of severe hypertension. Factors such as age, history of hypertension, heredity, gender, environment, and culture have an important role in the occurrence of hypertension (Kusmana, 2009). Increasing age can interfere with the regulation of calcium metabolism, resulting in increased blood density and blood pressure (Dewi, 2010).

Exercise also has an important role in lowering blood pressure. Through exercise, cardiac output can increase and the distribution of oxygen throughout the body becomes better. It also causes vasodilation in parts of the body that need more oxygen, which in turn helps lower overall blood pressure (Tristyaningsih, 2011). In this context, aerobic exercise becomes an important part of the hypertensive gymnastics program. Aerobic exercise can have a positive effect on blood fat profiles, reduce total cholesterol, LDL, and triglycerides, and increase HDL. In addition, aerobic exercise is also proven to have a positive impact on lowering blood pressure (Puji, 2007).

#### 4. Conclusion

This study investigated the effect of aerobic exercise program on lowering blood pressure in elderly people with hypertension in Cibungur Village. From the results of the study, the following findings were obtained:

- 1) Positive Changes in Blood Pressure: After following an aerobic exercise program, there is a decrease in systolic and diastolic blood pressure in elderly people with hypertension. These changes show the positive impact of aerobic exercise programs in helping to reduce blood pressure.
- 2) Effectiveness of Aerobic Gymnastics Program: Aerobic gymnastics program is proven effective in lowering blood pressure in elderly people with hypertension. Movements such as High Footsteps, Fist and Kick Stances, Side Steps, and others, have a significant contribution to lowering blood pressure.
- 3) Benefits for Hypertensive Elderly Populations: These findings have important implications for the management of hypertension in the elderly. Aerobic exercise programs can be an effective alternative and relatively easy to implement in an effort to reduce blood pressure in the elderly population with hypertension.
- 4) Steps Toward Hypertension Management: Although this study provides a positive initial outlook on the effectiveness of aerobic exercise programs, further research is needed with larger sample sizes and control groups. Further research will provide deeper insight into the long-term benefits of aerobic exercise programs in the management of hypertension in the elderly.

Overall, this study shows that aerobic exercise programs have the potential to help lower blood pressure in elderly people with hypertension. The clinical implications of this study could aid in efforts to prevent and manage hypertension in the elderly population, as well as provide alternative interventions that can be accessed with relative ease.

## References

- DiPerna, P. (2023). *Pricing the Priceless: The Financial Transformation to Value the Planet, Solve the Climate Crisis, and Protect Our Most Precious Assets*. John Wiley & Sons.
- Coughlin, S. S., & Ekwueme, D. U. (2009). Breast cancer as a global health concern. *Cancer epidemiology*, 33(5), 315-318.
- Paez, A. (2017). Gray literature: An important resource in systematic reviews. *Journal of Evidence-Based Medicine*, 10(3), 233-240.
- Doran, J. W., & Zeiss, M. R. (2000). Soil health and sustainability: managing the biotic component of soil quality. *Applied soil ecology*, 15(1), 3-11.
- Fukai, K., Ogawa, H., & Hescot, P. (2017). Oral health for healthy longevity in an ageing society: maintaining momentum and moving forward. *International Dental Journal*, 67, 3-6.
- Arsela, A., Fadillah, D. R., Wulandari, S., & Utami, T. A. T. (2021). Ownership of Health Insurance and Use of Traditional Medicine. *International Archives of Medical Sciences and Public Health*, 2(1).
- Chivian, E. (2002). *Biodiversity: its importance to human health*. Center for Health and the Global Environment, Harvard Medical School, Cambridge, MA, 23.
- Di Napoli, M., Castagliuolo, G., Badalamenti, N., Maresca, V., Basile, A., Bruno, M., ... & Zanfardino, A. (2022). Antimicrobial, antibiofilm, and antioxidant properties of essential oil of *Foeniculum vulgare* Mill. leaves. *Plants*, 11(24), 3573.
- Colombo, M. L., Assisi, F., Della Puppa, T., Moro, P., Sesana, F. M., Bissoli, M., ... & Davanzo, F. (2010). Most commonly plant exposures and intoxications from outdoor toxic plants. *Journal of pharmaceutical sciences and research*, 2(7), 417.
- Erenler, A. K., Baydin, A., Duran, L., Yordan, T., & Turkoz, B. (2011). A case of respiratory failure due to poison hemlock poisoning presented to an emergency department. *Hong Kong Journal of Emergency Medicine*, 18(4), 235-238.
- Downs, C., Phillips, J., Ranger, A., & Farrell, L. (2002). A hemlock water dropwort curry: a case of multiple poisoning. *Emergency medicine journal*, 19(5), 472-473.