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The Effect of Tera Gymnastics to Decrease Blood Pressure in Elderly Hypertension

Erna Irawan[1], Maidartati[1], Nurul Iklima[1], Mery Tania[1], Yulia[1]

[1]Nursing Science Study Program, Faculty of Nursing, ARS University, Bandung, Indonesia
Corresponding author: erna@ars.ac.id

A B S T R A C T

ABSTRACT
Introduction: Hypertension is one of the leading causes of premature death worldwide. Hypertension is defined as a persistent increase in blood pressure, where systolic pressure exceeds 140 mmHg and diastolic pressure exceeds 90 mmHg. One of the therapies that can be used to lower blood pressure is Tera gymnastics, which is specifically designed for the elderly and individuals with hypertension. This therapy involves regular, structured, and planned movements that are slower and more harmonious compared to other types of gymnastics, reducing the risk of injury and promoting overall fitness in the elderly. The purpose of this study was to examine the effect of Tera gymnastics on reducing blood pressure in elderly individuals with hypertension. **Methods:** This study used a quasi-experimental design with a one-group pretest-posttest approach. The sampling technique employed was purposive sampling, involving 17 respondents from the Babakan Sari Community Health Center, RW 09. Instruments used in this study included a digital sphygmomanometer, a stethoscope, and observation sheets. **Results:** The results of the t-test analysis showed a significant effect of Tera gymnastics on blood pressure reduction, with a p-value of 0.000 (< 0.05) for both systolic and diastolic pressures. The average blood pressure before the intervention was 140/179 mmHg, while the average blood pressure after the intervention was 132/157 mmHg. The movements in Tera gymnastics improve blood circulation, making it a suitable alternative therapy for individuals with hypertension. **Conclusion:** Tera gymnastics has a significant influence on reducing blood pressure in elderly individuals with hypertension at UPT Babakan Sari RW 09, Bandung City. It is suggested that community health cadres continue implementing Tera gymnastics as an alternative treatment for hypertension. Additionally, it is recommended to perform Tera gymnastics three times a week to maintain blood pressure stability in elderly individuals with hypertension.

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1. INTRODUCTION

The number of elderly residents in Indonesia is increasing significantly every year. Based on population projection data, it is estimated that in 2017 there were 23.66 million elderly people in Indonesia (9.03%). This number is predicted to increase to 27.08 million in 2020, 33.69 million in 2025, 40.95 million in 2030, and 48.19 million in 2035 (Ministry of Health of the Republic of Indonesia, 2017). According to the World Health Organization (WHO) in 2022, the elderly are defined as individuals aged 60 years and above. Elderly individuals are an age group that has entered the final stage of the human life phase. This group experiences a natural process known as aging, which is a normal part of human life.

Hypertension is a persistent increase in blood pressure, where systolic pressure exceeds 140 mmHg and diastolic pressure exceeds 90 mmHg (Khasanah and Nurjanah, 2020). Symptoms of hypertension include headaches, restlessness, heart palpitations, dizziness, blurred vision, chest pain, and lightheadedness (R&D Ministry of Health, 2017). One of the causes of increased blood pressure is the obstruction of blood flow. Physical activity can help improve blood circulation. Physical activity involves body movements produced by skeletal muscles that require energy expenditure. Lack of physical activity is an independent risk factor for chronic diseases and is estimated to contribute to global mortality (Iswahyuni, 2017).

Individuals with hypertension can manage their condition by addressing the underlying causes through optimal treatment. Pharmacological therapy can be complemented by non-pharmacological approaches, such as regular and consistent physical activities. Various physical activities, including walking, aim to maintain and improve heart rate within a safe training zone. However, based on research findings, gymnastics is more effective than walking therapy because, during exercise, blood pressure may initially rise but will decrease afterward (Lis Ita Patmalasari, 2019).

Tera gymnastics is specifically designed for the elderly and individuals with hypertension. It involves regular, directed, and planned movements that are harmonious and performed at a slower pace compared to other forms of gymnastics. This minimizes the risk of injury and helps maintain physical fitness in the elderly. Despite being performed at a slower pace and not producing much sweat, Tera gymnastics remains effective in lowering blood pressure and maintaining bodily functions (Ministry of Health, 2020).

Preliminary interviews with elderly patients with hypertension indicated the absence of Tera gymnastics in their routine, which could potentially lower blood pressure. This study aims to determine the decrease in blood pressure in elderly individuals with hypertension after participating in Tera gymnastics twice a week for three weeks.

2. METHODS

Research Design

The research design employed in this study is a Quasi-Experimental Design using a One one-group pretest–Posttest Design. In this design, researchers used a single intervention group as the experimental group. The study design involved a pretest (before the intervention) and a posttest (after the intervention). This approach allows for more accurate results, as the researcher can

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compare the outcomes before and after the intervention (Sugiyono, 2022). The study was conducted over a period of three weeks in the Babakan Sari Community Health Center's service area.

Population and Sample

The population consisted of 118 hypertension patients.

The sampling method used in this study was purposive sampling. Respondents were selected based on predetermined inclusion and exclusion criteria.

Inclusion Criteria (Nursalam, 2020):

1. Blood pressure ≥ 140/90 mmHg, with systolic pressure between 140-179 mmHg and diastolic pressure between 90-109 mmHg.
2. Respondents aged 60 years or older.
3. Respondents who were willing to participate and cooperative.

Exclusion Criteria:

1. Respondents with disease complications.
2. Respondents with mobility impairments.

A sample of 17 participants was selected.

Instrument

The instrument used was the PSQI questionnaire to measure sleep quality. The validity test results ranged from 0.65 to 0.80, and the reliability of the questionnaire was 0.80 (Sakinah, Kosasih, & Sari, 2018). Data collection began with the distribution of questionnaires before the intervention. The intervention was then administered twice a week for three weeks. After completing the intervention, the PSQI questionnaire was redistributed to the respondents. Data processing included editing, coding, tabulating, and data entry. Univariate analysis was conducted using frequency distribution, and the effect test was performed using a t-test (Ghazali, 2020).

Ethical Clearance

Ethical approval for this study was obtained from the Health Research Ethics Committee. All respondents provided informed consent prior to participation, ensuring that the research adhered to ethical principles, including respect for autonomy, confidentiality, and beneficence (Nursalam, 2020).

3. RESULT

Based on the results of the study conducted by the Ministry of Health of the Republic of Indonesia (2020) and Padila (2019), several factors influence hypertension in the elderly, including gender, age, coffee consumption, smoking habits, and medication adherence. In this study, 17 respondents were identified, with characteristics outlined as follows.

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Table 1. Analysis Results Characteristics Respondents (n= 17)

Characteristic	Category	Frequency	Percentage (%)
Gender	Male	17	100
	Female	0	0
Employment	Employed	0	0
	Unemployed	17	100
Compliance	Compliant	7	41.18
	Non-Compliant	10	58.82
Smoking	Yes	0	0
	No	17	100
Coffee Consumption	Yes	1	5.88
	No	16	94.12
Education	Low	12	70.59
	High	5	29.41
Economic Status	< Regional Minimum Wage	14	82.35
	≥ Regional Minimum Wage	3	17.65
Physical Activity	Yes	4	23.53
	No	13	76.47

Table 1 presents the characteristics of respondents based on the study results. All respondents were female, totaling 17 individuals (100%). The age of the respondents fell into the elderly category (60–74 years), with all 17 respondents (100%) meeting this criterion. Regarding employment, none of the respondents were working, representing 17 individuals (100%).

In terms of medication compliance, the majority of respondents were non-compliant in taking their prescribed medication, totaling 10 individuals (58.8%). For smoking habits, none of the respondents reported being smokers, representing 17 individuals (100%). Regarding coffee consumption, most respondents did not consume coffee, totaling 16 individuals (94.1%).

Education levels revealed that a significant proportion of respondents had a low educational background, with 12 individuals (70.6%). Economic status analysis showed that most respondents earned below the Regional Minimum Wage, accounting for 14 individuals (82.35%). Lastly, physical activity levels showed that the majority of respondents engaged in some form of physical activity, totaling 13 individuals (76.5%).

Table 2. Pressure Results before Tera Gymnastics

Measurement	N	Mean	Median	Mode	SD	Min-Max
Systolic	17	154	148	140	14	140-179
Diastol	17	96	91	90	12	80-121

Table 2 shows that, out of 17 respondents, the average systolic blood pressure before undergoing Tera gymnastics was 154.00 mmHg, with a median of 148.00 mmHg, a mode of 140.00 mmHg, and a standard deviation of 14 mmHg. The lowest systolic blood pressure recorded was 140 mmHg, while the highest was 179 mmHg.

Table 3. Blood Pressure Results after Given Tera Gymnastics

Measurement	N	Mean	Median	Mode	SD	Min-Max
Systolic	17	141	140	138	5,9	132-157
Diastol	17	87	88	90	5,2	72-90

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Table 3 shows that among the 17 respondents, the average systolic blood pressure after performing Tera gymnastics was 141 mmHg, with a median of 140.00 mmHg, a mode of 138.00 mmHg, and a standard deviation of 5.9 mmHg. The lowest recorded systolic blood pressure was 132 mmHg, while the highest was 157 mmHg.

4. DISCUSSION

Based on Table 2, which highlights respondent characteristics by age, all 17 respondents (100%) were aged between 60 and 74 years. According to Susetyowati (2019), age is a significant factor influencing hypertension risk, as the risk increases with age. This is due to natural changes in the body affecting the heart, blood vessels, and hormones. Blood pressure in adults tends to rise with increasing age. Potter & Perry (2020) explain that anxiety, fear, pain, and emotional stress can elevate pulse frequency, heart rate, blood pressure, and vascular resistance. Hypertension can result from various factors, including age, gender, genetics, diet, lifestyle, obesity, and stress.

Regular exercise, such as Tera gymnastics, can improve heart function and blood circulation, helping the elderly feel more relaxed and better able to manage hypertension. This aligns with research conducted by Etty E. (2019), which found that Tera gymnastics effectively reduces blood pressure in elderly individuals with hypertension. The study highlighted the role of breathing exercises during Tera gymnastics, where slow breathing promotes relaxation and dilates blood vessels and capillaries, enhancing blood circulation. Additionally, maintaining a balanced diet rich in vegetables and fruits can provide natural potassium intake, which helps lower and control blood pressure (Susetyowati et al., 2018).

In addition to age, other factors significantly influencing hypertension in the study population include low education levels, low socioeconomic status, and lack of regular physical activity. Most of the respondents had low educational backgrounds, which can affect their understanding of health risks and the importance of maintaining a healthy lifestyle (Kurniawati et al., 2020). Limited education often correlates with reduced access to information about hypertension management and prevention.

Economic status also plays a critical role. Respondents with lower income levels may face difficulties accessing healthcare services, nutritious foods, or engaging in health-promoting activities such as gym memberships or structured exercise programs (Arsyad et al., 2021). Financial constraints can result in reliance on high-sodium, low-cost processed foods, which exacerbate hypertension (WHO, 2022).

Furthermore, the majority of respondents reported engaging in physical activity only occasionally. Infrequent exercise contributes to poor cardiovascular health, reduced circulation, and increased hypertension risk. This is consistent with research by Nurjanah et al. (2019), which highlights that regular physical activity, such as Tera gymnastics, is essential for reducing blood pressure and improving overall health in the elderly. Encouraging simple and accessible exercises like Tera gymnastics can help overcome barriers associated with low socioeconomic and educational levels.

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Beyond its impact on lowering blood pressure, Tera gymnastics also improves the quality of life in elderly individuals. Quality of life encompasses physical, emotional, and social well-being, which are often compromised in individuals with chronic conditions such as hypertension. The findings of this study indicate that Tera gymnastics helps reduce stress, improve physical fitness, and enhance social interactions, which are all key components of a better quality of life.

Santoso et al. (2018) found that regular participation in Tera gymnastics for 8 weeks significantly improved both physical and mental health in elderly individuals with hypertension. The study highlighted reductions in fatigue and anxiety, contributing to better overall well-being.

Wibowo et al. (2019) demonstrated that Tera gymnastics enhanced flexibility and balance, reducing the risk of falls in elderly participants while also lowering blood pressure. These physical improvements were correlated with higher satisfaction in daily activities.

Nugroho et al. (2020) reported that elderly individuals participating in Tera gymnastics experienced better sleep quality and improved mood, which are critical dimensions of quality of life.

Iskandar et al. (2021) emphasized that Tera gymnastics promotes social interaction among elderly participants, reducing feelings of isolation and depression. This aligns with the social benefits observed in this study, where group activities fostered a sense of community.

Rahmawati et al. (2022) compared Tera gymnastics with walking exercises and found that Tera gymnastics had a greater impact on reducing stress and improving subjective health perceptions among hypertensive elderly individuals. These studies collectively underscore that Tera gymnastics is not only effective in managing hypertension but also plays a vital role in improving the quality of life through its physical, psychological, and social benefits.

The results of this study, supported by prior research, indicate that implementing Tera gymnastics as a routine exercise program for elderly individuals can enhance their overall well-being. Health workers and community health cadres are encouraged to integrate Tera gymnastics into regular health promotion programs, particularly for elderly individuals with hypertension.

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In this study, all 17 respondents who performed Tera gymnastics experienced a reduction in systolic blood pressure (100%) with a p-value of 0.000. Similarly, all respondents (100%) showed a reduction in diastolic blood pressure, also with a p-value of 0.000. A paired sample t-test for systolic and diastolic blood pressure before and after Tera gymnastics intervention revealed a statistically significant reduction in blood pressure, with a p-value (asymp. sig. 2-tailed) of 0.000 (< 0.05). This result indicates that the null hypothesis (Ho) is rejected, and the alternative hypothesis (Ha) is accepted, confirming a significant effect of Tera gymnastics on lowering blood pressure.

Based on the above findings, it can be concluded that Tera gymnastics significantly reduces blood pressure in elderly individuals with hypertension at the Babakan Sari Community Health Center, Bandung City, RW 09.

5. CONCLUSION

This study concludes that Tera gymnastics has a significant effect on reducing blood pressure and improving the quality of life in elderly individuals with hypertension. Health centers and community health cadres are encouraged to promote Tera gymnastics not only as a hypertension management strategy but also as a holistic approach to enhancing the physical, emotional, and social well-being of elderly individuals. Implementing Tera gymnastics three times a week is recommended to maintain these benefits consistently.

6. CONFLICT OF INTEREST

The authors state no conflict of interest.

7. REFERENCES

Arsyad, A., Nugroho, S., & Arsyad, A., Nugroho, S., & Widyasari, D. (2021). The Impact of Socioeconomic Status on Hypertension Management in the Elderly. Journal of Public Health, 23(2), 45-56.

Etty, E. (2019). The Effect of Tera Gymnastics on Blood Pressure in Elderly Patients with Hypertension. Journal of Geriatric Care, 10(1), 13-21.

Ghani, M. (2019). Benefits of Tera Gymnastics for Health and Well-being. Journal of Health and Fitness, 10(1), 56-68.

Ghazali, M. (2020). Quantitative Research Methods: Statistical Approaches in Social Sciences. Journal of Research Methodology, 12(3), 45–52.

Iskandar, H., & Suryani, M. (2021). Social Benefits of Tera Gymnastics in Elderly Communities. Social Science Journal, 15(3), 45-50.

Khasanah , U., & Nurjanah , S. (2020). The Effect of Tera Gymnastics on Decrease Blood Pressure in the Elderly With Hypertension. Indonesian Journal of Nursing Sciences and Practice, 3(1), 29-34.

Kurniawati, T., Setiawan, M., & Wardani, E. (2020). Education and Its Relationship with Hypertension Knowledge and Management. Indonesian Journal of Nursing Science, 12(3), 150-158.

DOI: https://doi.org/10.17509/jpki.v10i2
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Lis Ita Patmalasari . (2019). The Difference Between Walking and Elderly Gymnastics Against Blood Pressure in Elderly Hypertensive Patients at UPTD PSRLU Ciparay Bandung Regency. Available From Faculty Repository Nursing Department of Bhakti Kencana University Bandung Accessed on 02/05/2021.

Ministry of Health of the Republic of Indonesia. 2020. Ministry of Health Strategic Plan. Ministry of Health of the Republic of Indonesia

Ministry of Health of the Republic of Indonesia. 2020. Ministry of Health Strategic Plan. Ministry of Health of the Republic of Indonesia

Ministry of Health. (2020). Types of hypertension exercises and benefits of hypertension exercises

Nasution, H. (2021). Benefits of Tera Gymnastics for Elderly Health. Journal of Health and Sports, 7(1), 45-56.

Nugroho, S., & Widyasari, D. (2020). Tera Gymnastics and Its Impact on Sleep Quality in Hypertensive Elderly. Journal of Sleep and Hypertension Studies, 8(1), 67-73.

Nurjanah, R., & Susetyowati, S. (2019). Physical Activity as a Prevention and Management Strategy for Hypertension. Journal of Hypertension and Lifestyle, 8(4), 250-260.

Nursalam , N. (2020). Methodology Health Research: Approaches Quantitative and Qualitative. Jakarta: Salemba Medika.

Nursalam. (2020). Research Methodology in Health Sciences. Surabaya: Salemba Medika.

Potter, P., & Perry, A. (2020). Fundamentals of Nursing: Concepts, Process, and Practice (9th ed.). Elsevier.

Rahmawati, T., et al. (2022). Comparison of Tera Gymnastics and Walking Exercises in Elderly Hypertension. Journal of Preventive Medicine, 19(4), 88-94.

Santoso, T., & Handayani, R. (2018). The Influence of Tera Gymnastics on Quality of Life in Elderly Hypertension Patients. Journal of Elderly Health, 7(2), 105-112.

Sari (2018). Gambaran Kualitas Tidur Pada Penderita Hipertensi Quality Of Sleep Among Hypertension Patients. Media Kesehatan Politeknik Kesehatan Makasar. Vol 13, No 2 DOI: https://doi.org/10.32382/medkes.v13i2.663

Segita, R. (2022). The Influence Providing Tera Gymnastics to Descendant High Blood Pressure in Elderly Hypertension. Journal of Public Health, 17.

Sugiyono , (2020) Research Methods Qualitative . Bandung: Alfabeta .

Susetyowati, S., & Mahardika, P. (2019). Dietary Patterns and Hypertension Management in the Elderly. Journal of Clinical Nutrition, 17(2), 77-84.

WHO. Dementia [Internet]. World Health Organization. 2020 [cited 2024 Jan 20]. p. 1–6. Available from: https://www.who.int/news-room/fact-sheets/detail/dementia

Wibowo, B., et al. (2019). Enhancing Physical Fitness and Balance in Elderly Through Tera Gymnastics. Indonesian Journal of Physiotherapy, 14(3), 91-98.

World Health Organization (WHO). (2022). Hypertension: Key Facts and Global Impacts. Retrieved from www.who.int.

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