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Original Article

The Effect of Five-Minute Hypertension Gymnastics in Lowering Blood Pressure among Older Adults in Segihan Sebulu Village, Kutai Kartanegara

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Abstract

Background: As the older age, it is susceptible to various degenerative diseases, one of which is changes in the cardiovascular system. Hypertension gymnastics is a form of exercise aimed at increasing blood flow and oxygen supply to active muscles and the skeletal system, particularly the heart muscle, to lower blood pressure. This study aims to determine the effect of 5 minutes of hypertension gymnastics on lowering blood pressure in the elderly in Segihan Sebulu Village, Kutai Kartanegara.

Methods: This study is a quantitative study with a one-group pre-test-post-test pre-experiment design. The sample consists of 30 elderly participants selected using Purposive Sampling. Data collection involved a digital sphygmomanometer, and data analysis was conducted using the Paired Samples T-Test.

Results: The results of this study showed that the average blood pressure before the intervention was 158/97 mmHg, and after the intervention, it lowered to an average of 148/92 mmHg. The paired samples t-test resulted in p-value = 0.000.

Conclusion: This study concludes that a 5-minute hypertension exercise significantly reduces blood pressure in the elderly in Segihan Sebulu Village, Kutai Kartanegara. It highlights the importance of physical exercise in preventing decreased body function and high blood pressure in the elderly. However, not all physical exercises are suitable for the elderly, and 5-minute hypertension exercise could facilitate lowering blood pressure in the elderly.

Introduction

According to WHO, the elderly are those who have reached the age of 60 years or older. Elderly refers to the final stage of the aging process, characterized by a decline in the physiological function of body organs characterized by wrinkled skin due to reduced fat pads, graying hair, reduced hearing, deteriorating vision, teeth starting to become toothless, slow activity, decreased appetite and other declining body conditions.[1] As people age, physiological changes occur in their bodies, accompanied by various health problems, leading to highly degenerative diseases. Degenerative diseases have consequences for changes and disorders in the cardiovascular system, including hypertension.[2]

Blood pressure tends to increase after the age of 45-55 years. This is due to the thickening of arterial walls caused by the accumulation of collagen in the muscle layer. Consequently, the blood vessels gradually narrow and become stiff as a result of reduced elasticity in the central artery which cause elderly blood pressure increases.[3] The global prevalence of hypertension in 2012 was 29.2% in men and 24.8% in women. Notably, African countries have some of the highest rates of hypertension, with 38.1% in men and 35.5% in women. In contrast, Southeast Asia has a lower prevalence of hypertension, with 25.4% in men, and parts of America have just 19.7% prevalence in women.

Based on the Basic Health Research 2018 results, the prevalence of high blood pressure in East Kalimantan Province was 39.3%, which increases with age. Compared to the Basic Health Research 2013, which reported a prevalence of 29.6%, the prevalence of high blood pressure has significantly increased. In East Kalimantan Province, a prevalence of 33.8% was found in Kutai Kartanegara Regency, which ranked the regency in second place with the highest prevalence. Exercise strengthens the body and promotes overall health by improving cardiovascular and respiratory systems as a homeostatic response.[4] A good sport that people with hypertension frequently do is aerobic exercise. One type of aerobic exercise is hypertension gymnastics. For older adults who suffer from mild hypertension, if they do hypertension gymnastics regularly, their systolic and diastolic blood pressure will decrease.

Exercise, such as hypertension gymnastics, can promote optimal heart function. Exercise increases the energy needs of cells, tissues, and organs, leading to an increase in cardiac output and arterial blood pressure. After this initial increase in blood pressure, the body's response includes reduced respiratory activity and skeletal muscles, which causes sympathetic nerve activity to decrease, subsequently leading to a decrease in heart rate, stroke volume, and arteriovenous vasodilation. This ultimately results in decreased cardiac output and total peripheral resistance, leading to reduced blood pressure.[5] Hypertension gymnastics is an exercise that aims to enhance blood flow and oxygen supply to active muscles and skeletons, especially to the heart muscle[6]. Hypertension gymnastics goals include reducing weight, managing stress, and lowering blood pressure.

Darma Bhakti Nursing Home in Pajang Village, Surakarta, 28 older adults participated in hypertension gymnastics for 30 minutes twice weekly for two weeks.[6] The study was conducted on 28 older adults for 30 minutes and was carried out for two weeks with two weekly meetings. The average blood pressure before exercise was 151/95 mmHg, which reduced to 130/82 mmHg after the exercise sessions. This

indicated a positive impact of hypertension gymnastics on lowering blood pressure in the elderly. Therefore, this study aims to determine the effect of 5 minutes of hypertension gymnastics on lowering blood pressure in the elderly in Segihan Sebulu Village, Kutai Kartanegara.

Methods

This research was quantitative, with a pre-experiment design of One Group Pre-test-Post-test. In this design, the researcher compares the post-test value, which is measured after the intervention. The population in the study was all older adults in Segihan Village, totaling 80 people. The sample was 30 older adults selected using the Purposive Sampling, with inclusion criteria based on willingness to participate, ability to follow instructions, and absence of physical limitations that could hinder exercise.

This study received ethical approval from the STIKES Majapahit Mojokerto Ethics Committee. Prior to participation, all respondents were provided with a detailed explanation of the study objectives, procedures, potential risks, and confidentiality assurances. Written informed consent was obtained from each participant. Participants performed a 5-minute hypertension gymnastics routine consisting of rhythmic, low-impact aerobic movements adapted for older adults. This duration was chosen based on a preliminary feasibility observation conducted by the research team, which indicated that most elderly participants in the area could not sustain longer sessions due to fatigue or physical limitations. Although previous studies used 30-minute formats, the 5-minute duration proved more practically acceptable and safer in this community context.

Blood pressure was measured using a digital Yuwell YE660B sphygmomanometer, which was calibrated and validated before data collection. Measurements were taken twice from the right upper arm while the participant was in a seated position with arm at heart level, following a 10-minute resting period. The two readings were averaged for analysis.

All data were processed and analyzed using SPSS software. Paired Samples T-test was applied to compare pre- and post-intervention systolic and diastolic blood pressure. A significance level of $p < 0.05$ was used to determine statistical significance.

Results

Table 1 indicates that female respondents numbering 30 people (100%) are aged 60-65 years, numbering 30 people (100%). The dominant respondents did not attend school, numbering 23 people (76.7%) and had jobs as farmers, numbering 17 people (56.7%). Respondents mostly had indications for antihypertensive therapy, numbering 16 people (53.3%).

Table 1. Respondent Characteristics (n=30)

Respondent Characteristics	Frequency (N)	Presentation (%)
Age		
60-65 years	30	100,0
Gender		
Female	30	100,0
Male	0	0
Education		
No School	23	76,7
Elementary School	5	16,7
JHS	2	6,7
Job		
Farmer	17	56,7
House Wife	13	43,3
Medicine		
Yes	16	53,3
No	14	45,7

Table 2. Descriptive Statistics of Blood Pressure (n=30)

Statistic value	Pre Test		Post Test	
	Sistole	Diastole	Sistole	Diastole
Lowest	130	87	127	84
Highest	195	100	178	100
Mean	158	97	148	92
Min-Max	130-195	80-118	127-178	78-112
Standard Deviaton	19.5	10.0	14.2	8.1

Table 2 demonstrates the systolic and diastolic blood pressure before and after hypertension gymnastics intervention. Table 3 shows the results of the statistical test. It shows that the t-value for systolic exercise before and after was 6.881, which is greater than the t-table value of 2.045, and the p-value was 0.000, indicating significance at $p < 0.05$. Similarly, the t-value for diastolic exercise before and after was 4.225, which is also more significant than the t-table value of 2.045, with a p-value of 0.000. Based on these results, it can be concluded that a 5-minute hypertension gymnastics significantly reduces blood pressure in the elderly.

Discussion

Before the intervention, the average blood pressure of the participants was 158/97 mmHg. There were several classifications of hypertension observed in the study: prehypertension in six participants, grade 1 hypertension in ten participants, grade 2 hypertension in eight participants, and emergency hypertension in six participants. The study found that the elderly who experienced emergency hypertension were mostly 65 years old (three participants), while grade 2 hypertension was most common at the age of 62, and grade 1 hypertension at the age of 61. After a 5-minute hypertension gymnastics intervention, there were changes in the classifications of hypertension, with prehypertension in ten participants, grade 1 hypertension in twelve participants, grade 2 hypertension in eight participants, and none in the emergency hypertension classification. Consequently, the average blood pressure of the participants decreased to 148/92 mmHg. This indicates that a 5-minute hypertension gymnastics can effectively lower blood pressure in the elderly.

These findings corroborate previous international evidence showing that short-duration aerobic exercise can effectively lower blood pressure in elderly populations. A 2023 meta-analysis by Gao et al. reported that structured aerobic programs resulted in mean reductions of approximately 9 mmHg in systolic blood pressure among middle-aged and older adults, supporting the clinical relevance of even brief interventions.[7] Similarly, a pilot RCT in sedentary older adults demonstrated that low-to-moderate intensity aerobic training over eight weeks led to a modest but significant drop in resting systolic blood pressure.[8] In our single-session, 5-minute intervention, we observed a larger immediate effect—a 10 mmHg reduction in systolic and 5 mmHg in diastolic pressure—with none of the participants remaining in the emergency hypertension category post-intervention, indicating meaningful acute clinical benefit.

Global and experimental data further underline the value of this approach. The World Health Organization's 2020 guidelines

Table 3. The Effect of 5-Minute Hypertension Exercise on Reducing Blood Pressure in the Elderly (n=30)

Variabel		N	Mean	Standard Deviaton	Mean Difference	t	p-value
Sistole	Before	30	158	19,5	10	6,881	.000
	After	30	148	14,2			
Diastole	Before	30	97	10,0	6	4,255	.000
	After	30	92	8,1			

emphasize that any physical activity, even of low intensity and short duration, provides cardiovascular benefits for adults over 60.[9] Additionally, acute aerobic exercise has been shown to reduce ambulatory blood pressure throughout the day, a phenomenon known as post-exercise hypotension, supporting the plausibility of immediate BP reductions following even brief activity.[10] Together, these findings reinforce the potential of implementing a low-cost, scalable 5-minute hypertension gymnastics program in community and rural settings where longer exercise sessions may be impractical.

This study has several limitations. First, the sample consisted entirely of female participants aged 60–65 years, limiting the generalizability of the findings to broader populations, including males or older adults in different age brackets. Future research should aim for more diverse and representative samples. Second, while the blood pressure reductions observed were statistically significant, we did not report effect size (e.g., Cohen's d) due to the exploratory nature of this community-based intervention and the small, homogeneous sample. The primary goal of this study was to examine feasibility and immediate physiological response, rather than to establish generalizable effect magnitude. We recommend that future studies with larger sample sizes and randomized control designs consider including effect size to complement statistical significance and enhance clinical interpretation.

Conclusion

This study demonstrated that a brief, 5-minute hypertension gymnastics intervention significantly reduced both systolic and diastolic blood pressure in older adults. The results highlight that even a short-duration exercise program can have measurable benefits for cardiovascular health in elderly populations. Given its simplicity, low cost, and time efficiency, this intervention is particularly suitable for rural and resource-limited settings. It holds promise for integration into community-based elderly care programs as a scalable strategy for hypertension management. However, future studies are recommended to validate these findings in larger, more diverse populations and with longer follow-up periods to assess sustainability and long-term outcomes.

Declaration of Interest

The authors declare that they have no conflict of interest regarding the publication of this article. This research was conducted independently, and no financial or commercial relationships were involved that could be interpreted as a potential conflict of interest.

References

1. Padila. *Buku Ajar Keperawatan Gerontik*. Nuha Medika; 2013.
2. Daromes VR, Terok M, Lumi F. Perubahan Tingkat Stres Pada Pasien Hipertensi Lanjut Usia Setelah Mendapatkan Terapi Musik. *Juiperdo*. 2019;7(2):137-145.
3. Premanisa NPW, Ruqayyah S, Nirmala S, Wiatma DS. Pengaruh Latihan Fisik Aerobik Terhadap Perubahan Tekanan Darah dan IMT Pada Lanjut Usia di Panti Sosial Lanjut Usia Mandalika Nusa Tenggara Barat. *Malahayati Nurs J*. 2023;5(10):3446-3461. doi:10.33024/mnj.v5i10.9895
4. Pescatello LS, Buchner DM, Jakicic JM, et al. Physical Activity to Prevent and Treat Hypertension: A Systematic Review. *Med Sci Sports Exerc*. 2019;51(6):1314-1323. doi:10.1249/MSS.0000000000001943

5. Wati N anjar, Ayubana S, Purnowo J. Penerapan Slow Deep Breathing Terhadap Tekanan Darah Pada Pasien Hipertensi Di Rsud Jend. Ahmad Yani Metro. *J Cendikia Muda*. 2023;3(1):1-5.
6. Hernawan T, Rosyid FN. Pengaruh Senam Hipertensi Lansia terhadap Penurunan Tekanan Darah Lansia dengan Hipertensi di Panti Wreda Darma Bhakti Kelurahan Pajang Surakarta. *J Kesehat*. 2017;10(1):26-31. doi:10.23917/jurkes.v10i1.5489
7. Gao W, Lv M, Huang T. Effects of different types of exercise on hypertension in middle-aged and older adults: a network meta-analysis. *Front Public Health*. 2023;11:1194124. doi:10.3389/fpubh.2023.1194124
8. Alzahrani AA, Alqahtani AS, Vennu V, Bindawas SM. Feasibility and efficacy of low-to-moderate intensity aerobic exercise training in reducing resting blood pressure in sedentary older Saudis with hypertension living in social home care: a pilot randomized controlled trial. *Medicina (Kaunas)*. 2023;59(6):1171. doi:10.3390/medicina59061171
9. World Health Organization. *WHO Guidelines on physical activity and sedentary behaviour*. Geneva: WHO; 2020. Available from: https://www.ncbi.nlm.nih.gov/books/NBK566046/
10. Saco-Ledo G, Valenzuela PL, Ramírez-Jiménez M, Morales JS, Castillo-García A, Blumenthal JA, et al. Acute aerobic exercise induces short-term reductions in ambulatory blood pressure in patients with hypertension: a systematic review and meta-analysis. *Hypertension*. 2021;78(6):1844-58. doi:10.1161/HYPERTENSIONAHA.121.18099