

The Effect of Yoga Exercise on Reducing Blood Pressure among Elderly with Hypertension

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ABSTRACT

Background: Hypertension is a silent killer with no symptoms. One of the non-pharmacological treatments used is yoga exercises. This study aims to determine yoga exercise on reducing blood pressure among elderly with hypertension.

Subjects and Method: This study is a one-group pre and post-test conducted at the Tohudan Colomadu Karanganyar Elderly Posyandu from March to April 2024. A total of 19 elderly people aged 50 to 70 years were selected using purposive sampling. The dependent variable in this study was a decrease in blood pressure. The independent variable in this study was yoga gymnastics. The study was conducted by measuring blood pressure before and after yoga exercises using a sphygmomanometer. The collected blood pressure data was analyzed using SPSS.

Results: Average systolic blood clearance (Mean= 148.53; SD=6.62) and diastolic blood pressure (Mean= 93.26; SD= 2.05) before the intervention was higher than systolic blood pressure (Mean= 141.53; SD= 7.32) and diastolic blood pressure (Mean= 87.37; SD=2.29) after the intervention, and the results were statistically significant ($p < 0.001$).

Conclusion: Systolic blood pressure and diastolic blood pressure before intervention were higher than systolic blood pressure and diastolic blood pressure after intervention.

Keywords: Hypertension, blood pressure, yoga, elderly

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BACKGROUND

Hypertension or high blood pressure is a condition where a person's blood pressure is at 130/80 mmHg or more. Hypertensive disease can also be called a silent killer disease which means this disease often occurs without any complaints and signs that appeared before (WHO, 2018). Hyper-

tensive disease that is left can cause complications such as heart disease, kidney, and stroke. WHO data in 2018 states that almost 1.3 billion people in the world have hypertension. The prevalence of hypertension in developed and developing countries is still relatively high, while the prevalence of hypertension in developed countries is 35%

of the adult population and the prevalence of hypertension in developing countries is 40% of the adult population. The estimated number of people with hypertension in Indonesia is 63,309,620 people, and the death rate due to hypertension is 427,218. In Indonesia, hypertension occurs in the age group of 31-44 years 31.6%, age 45-54 years 45.3%, age 55-64 years 55.2%. Therefore, hypertension cannot be underestimated (Riskasdas, 2018).

Yoga is one of the activities that help increase physical activity in a person so that it can keep the body healthy. According to ancient scriptures, yoga is a science that allows us to live a more harmonious, balanced life by controlling the mind and body. So, yoga is our philosophy of life and every movement reflects the philosophy of life. Do it as much as you can and reasonably so that you can be ready to live a better life (Rohimawati, 2008).

Recent research shows that regular practice of yoga can provide significant benefits for elderly people with hypertension. A meta-analysis by Hagins et al. (2013) concluded that yoga consistently lowers blood pressure in various age groups, including the elderly. Another study that Posadzki et al. (2014) also showed that yoga can provide additional benefits in lowering blood pressure rather than relying on conventional treatment alone.

In addition, other factors such as decreased flexibility, increased joint stiffness, and decreased physical activity in the elderly can also affect blood pressure. Yoga offers a holistic approach with a focus on gentle body movements, postures, and coordinated breathing, which can help improve flexibility, strength, and balance. Research by Yang et al. (2022) highlights that yoga not only provides physical benefits but also affects mental and emotional well-being,

which is important for stress and blood pressure management.

Nonetheless, there is a need for further research to focus on the elderly population, due to their unique physical and psychological characteristics. More in-depth research on the effect of yoga on blood pressure in elderly people with hypertension will provide a better understanding of its effectiveness and pave the way for the development of more appropriate interventions. This study aims to determine how yoga gymnastics on blood pressure in the elderly with hypertension.

SUBJECTS AND METHOD

1. Study Design

The research design used in this study was one group pre and post test. This study used one group that would be given treatment in the form of yoga exercises. In one group, blood pressure measurements were taken before and after yoga exercises. The study will be conducted in March and April 2024. The research location chosen by the researcher was Posyandu Lansia Tohudan Colomadu Karanganyar.

2. Population and Sample

The target population in study is Tohudan Colomadu Karanganyar Elderly. The sampling technique used in this study was purposive sampling with inclusion criteria for the elderly aged 50 to 70 years, systole blood pressure 130-200 mmHg and diastole 80-110 mmHg and willing to participate in the study. Based on the results of the examination, there were 23 people who met the inclusion criteria. At the time of the study, there were 4 people who entered the drop-out criteria, so that the number of subjects included in the research results was 19 subjects. In this study, no grouping of subjects was carried out so there was only 1 treatment group.

3. Study Variables

The independent variable in this study was yoga exercises. The variable tied to this study is blood pressure in the elderly.

4. Conceptual Definition

Seniors: Seniors aged 60 - 70 years who are in Pacitan nursing homes that meet the inclusion criteria will be selected to participate in the research.

Yoga: is one of the physical exercises that connects breath, concentration and posture exercises that can cause the body to relax. Yoga gymnastics movements to lower blood pressure in the form of: initial stretching is done 8 times as many as 3 sets, vajrasana is done for 3 to 5 minutes as much as 1 set, half butterfly is done 5 times as many as 3 sets, pawamuktasana is done for 4 to 6 seconds as many as 3 sets, jathara parivartanasana is done for 6 to 10 seconds as many as 3 sets, sphinx pose is done for 10 seconds as many as 3 sets, Relaxation is done for 10 to 15 minutes as much as 1 set. This yoga exercise is done 2 times a week (Wednesday and Sunday) for 4 weeks.

Blood pressure: is the force or push against the artery wall when blood is pumped out of the heart to the rest of the body which is measured using a sphygmomanometer or commonly called a sphygmomanometer.

5. Study Instruments

The measuring instrument used in this study was a digital sphygmomanometer. A sphyg-

momanometer is a device used to measure blood pressure. Digital sphygmomanometers use a screen to show the results of a person's blood pressure. Research conducted by Eriska (2016) on the validity and reliability of digital sphygmomanometers with aneroid sphygmomanometer comparisons shows a digital sphygmomanometer sensitivity value of 88%, meaning that digital sphygmomanometers have the ability of 88% to correctly detect people who have hypertension.

6. Data Analysis

The data normality test in this study used the Shapiro-Wilk test because the data or subjects in this study were less than 50. The hypothesis test used in this study is paired t-test.

7. Research Ethics

A letter of approval for a research ethics permit was obtained from the Research Ethics Committee of the University of Muhammadiyah Surakarta with No. 5218/B.2/KEPK-FKUMS/III/2024.

RESULTS

1. Sample Characteristic

Table 1 shows the subjects characteristics of study. The average age of the study subjects was 66.53 years with male subjects as many as 7 people and women as many as 12 people. Systolic blood pressure characteristics were obtained an average of 148.53 mmHg and diastolic by 93.26 mmHg.

Table 1. Subjects characteristics (n=19)

Characteristic	Mean	SD	Min.	Max.
Age	66.53	2.24	61	70
Systolic Blood Pressure	148.52	6.62	140	160
Dyastolic Blood Pressure	93.26	2.05	90	96

2. Bivariate Analysis

The results of the normality test using the shapiro-wilk test of systolic and diastolic blood pressure pre test obtained a value of p

> 0.050 while the results of the systolic and diastolic blood pressure test post-test obtained a value of $p > 0.050$. From these results, it can be concluded that systolic

blood pressure data pre and post-test are normally distributed. Table 2 shows the results of the pre-test and post-test differences with paired t-test parametric tests where the average systolic blood pressure was obtained (Mean = 148.53; SD=6.62) and diastolic blood pressure (Mean= 93.26; SD=

2.05) before the intervention was higher than systolic blood pressure (Mean= 141.53; SD= 7.32) and diastolic blood pressure (Mean= 87.37; SD=2.29) after the intervention, and the results were statistically significant ($p < 0.001$).

Tabel 2. The effect of yoga exercise on reducing blood pressure

Blood Pressure	Mean	SD	p
Pre Intervention			
Sistole	148.53	6.62	<0.001
Diastole	93.26	2.05	
Post Intervention			
Sistole	141.53	7.32	<0.001
Diastole	87.37	2.29	

DISCUSSION

Average result of systolic blood clearance (Mean= 148.53; SD=6.62) and diastolic blood pressure (Mean= 93.26; SD= 2.05) before the intervention was higher than systolic blood pressure (Mean= 141.53; SD= 7.32) and diastolic blood pressure (Mean= 87.37; SD=2.29) after the intervention, and the results were statistically significant ($p < 0.001$). From these results, it shows that there is a significant difference. It was concluded that yoga treatment given 2 times per week for 4 weeks had an effect on reducing blood pressure in elderly people with hypertension.

Based on statistical analysis shows that the provision of yoga gymnastics treatment has an influence in reducing high blood pressure in elderly people with hypertension. The mean results of systolic blood pressure and diastolic blood pressure before the intervention were higher than systolic blood exposure and diastolic blood pressure after the intervention, and these results were statistically significant. From these results, it shows that there is a significant difference. It was concluded that yoga treatment given 2 times per week for 4 weeks had an effect on

reducing blood pressure in elderly people with hypertension.

This study took elderly subjects, hypertensive elderly population more compared to other age groups. Increasing age leads to a deterioration in the metabolic regulatory system. Indicated by the presence of lime or calcium mixed in the blood (hypercalcemia), the circulating blood will become thicker so that the work of the heart will be heavier which results in increased blood pressure. Similarly, if calcium settles on the walls of blood vessels which will cause (arteriosclerosis) where the arteries lose their flexible properties, become stiff, and narrow. So that the arteries cannot expand when the heart pumps blood through these arteries, disrupted blood flow makes blood pressure increase (Nadia, 2020).

Another study conducted by Khanam et al. (2022) found that regular practice of yoga can reduce blood pressure in the elderly, even in those with severe hypertension. The results of this study suggest that yoga has the potential as an effective adjunct therapy in the management of hypertension in the elderly population. The results of this study are also in line with research conducted by Kaleeswwari et al.

(2021), this study was conducted on 46 subjects. This study was conducted 2 days/week for 4 weeks. Results from this study showed significant changes in blood pressure in the treatment group.

Recent research published in the journal "Hypertension Research" by Sardar et al. (2023) found that regular practice of yoga can produce a significant reduction in systolic and diastolic blood pressure in elderly people with hypertension. In this study, they observed that consistently structured yoga practices can affect the autonomic nervous system, resulting in a decrease in blood pressure through relaxation mechanisms and a decrease in stress. These findings provide additional evidence confirming the positive role of yoga in blood pressure management in an elderly population with hypertension.

Yoga is recommended in people with hypertension, because yoga has a relaxing effect that can improve blood circulation throughout the body. Smooth blood circulation, indicating good heart work (Ridwan, 2009). Yoga also stimulates the production of endorphins. This hormone can function as a natural sedative produced by the brain that makes you feel good and increases endorphin levels in the body to reduce high blood pressure. When someone does gymnastics, endorphins will come out and be captured by receptors in the hypothalamus and limbic system that function to regulate emotions. Increased endorphins are proven to be closely related to decreased pain, improved memory, improved appetite, blood pressure and breathing (Sindhu, 2013).

The conclusion in the study is that yoga exercises affect the blood pressure of elderly people with hypertension. The limitation in this study is that researchers do not routinely participate in providing treatment in the field, researchers do not routinely participate in providing treatment in field.

AUTHOR CONTRIBUTION

Nurul Fithriati Haritsah As the main researcher who contributes to the selection of research topics, implementers of research activities, collects research data, and compiles research articles. Yoga Handita and Noerdjannah Contribute to analyzing research data, reviewing research documents and assisting in following research articles until the articles can be published in journals.

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CONFLICT OF INTEREST

There was no conflict of interest in this study.

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