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RESEARCH ARTICLE

Effects of Aerobic Exercise and Yoga on Blood Pressure in Women Between the Ages of 30 and 40 Years

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Abstract

High blood pressure or hypertension is a major risk factor for cardiovascular disease. This study aims to prove the effectiveness of aerobic exercise and yoga in lowering blood pressure in mothers. The study was conducted using experimental methods and involved 28 participants selected by purposive sampling from Nogosari village, Boyolali regency, Indonesia, during 12 sessions. Blood pressure data were collected from participants with hypertension before and after aerobic exercise and yoga. Measurements were taken on participants for 12 sessions in one month using a blood pressure monitor. The device used in this study was a sphygmomanometer ambulatory blood pressure monitoring (ABPM). Statistical tests were performed using independent samples t-tests with a significance level of $p < 0.05$. The results of the homogeneity test showed that the systolic and diastolic variance in the control and experimental groups had the same variance with a significance level of $p < 0.05$. The results of both mean difference tests showed that there were significant differences in systolic and diastolic blood pressure between the aerobic and yoga groups. This can be seen from the value of P-value Independent Samples t-test < 0.05. The results showed that low-impact aerobic exercise and yoga had a significant effect on blood pressure in women aged 30-40 years. Based on these data, it can be concluded that there is a significant decrease in systolic and diastolic blood pressure from the category of moderate hypertension to normal-high in women aged 30-40 years after doing aerobic exercise and yoga.

Keywords
Aerobic Exercise, Yoga, Blood Pressure, Women Aged 30-40 Years

INTRODUCTION

The older a person gets, the more the human body's immune system deteriorates (Spencer et al., 2017; Warreman et al., 2023). This physical decline will cause changes in a person according to their age. With increasing age, there are also various diseases that will easily attack the body due to the changes in the body, including infectious diseases, diseases due to the influence of wrong lifestyle, degenerative diseases and also infectious diseases (Abdel-aziem, 2024). The emergence of diseases in the body results in the deterioration of organ function from a normal state to worse, commonly referred to as degenerative diseases (Mendez Colmenares et al., 2021). Degenerative causes several types of diseases including kidney, heart, diabetes mellitus, stroke, blood pressure disorders, gout and others (Liguori et al., 2018; Nandi et al., 2019; Sharaf El Din et al., 2017 ;Thind et al., 2017

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). In addition to maintaining an adequate diet and rest, it is also necessary to engage in regular sports activities such as gymnastics. Therefore, awareness is needed to maintain the physical and mental changes of life in old age.

Cardiovascular disease, including hypertension, is a leading cause of death worldwide and often occurs in young adult women (Doewes et al., 2023; Franklin & Quindry, 2022). This highlights the importance of treating high blood pressure to prevent the risk of serious conditions such as stroke and heart disease. Aerobic exercise and yoga are two forms of exercise that have been shown to be beneficial in managing blood pressure and improving cardiovascular health in general (Alfiansyah, 2022; Arfanda, 2023; Shohani et al., 2020). Aerobic exercise, which involves rhythmic movement and most of the large muscles of the body, can improve blood circulation and heart strength (Espí-López et al., 2016; Thomas et al., 2023). Meanwhile, yoga offers a more holistic approach that focuses on breathing, posture and relaxation, which can help reduce stress and lower blood pressure (Peng & Xie, 2021; Shiraishi & Bezerra, 2016). Although the benefits of these two types of exercise have been recognised, more research is needed to understand the differences in effectiveness and relative benefits of each in the context of young adult women.

Aerobic exercise and yoga can help reduce blood pressure. The body's balance is affected by increases and decreases in blood pressure (Muñoz-Vera et al., 2017; Nobari et al., 2023).The flow of blood throughout the body is influenced by blood pressure, which gives it a boost. A person's blood pressure is not always good or stable. Unstable changes in blood pressure affect a person's health, especially someone who does not exercise (Gröpel et al., 2016; Schütz et al., 2023). Even the symptoms resulting from blood pressure instability are often overlooked and can lead to very dangerous diseases from blood pressure instability (Asiah et al., 2023; Thind et al., 2017).

There are two types of blood pressure disorders, including hypotension (low blood pressure) and hypertension (high blood pressure). Hypertension is an increase above the normal value described by systole and diastole (Lawrence et al., 2023; Lobene et al., 2022). While low blood pressure or hypotension is a decrease in systole up to 20-30% compared to normal, current systolic measurements show <100 mmHg (Pheiffer et al., 2023). Older people often complain of health problems, one of which is high blood pressure or hypertension. Hypertension is an increase in blood pressure >140/90 mmHg.

Uncontrolled hypertension can lead to stroke and heart failure (Naser et al., 2016; Xi et al., 2021). A person's blood pressure is good if systole shows 140 mmHg, even more if diastole below 90 mmHg is within normal limits, so this problem is called isolated systolic hypertension or ISH. The problems caused by this disorder are not only experienced by the elderly, but can also occur at a younger age. In particular, housewives who are busy with household chores are less likely to exercise. These habits cause health problems. This can reduce the immune system in the body, it will easily attack the body disease. By exercising regularly is an effort to keep the body healthy, fit, and can avoid diseases and viruses (Knight et al., 2022; Lobene et al., 2022).

Some research has shown that this blood pressure disorder is caused by a poor lifestyle and lack of exercise in everyday life. Therefore, the National Heart Foundation Joint National Committee on Detection, ASCM, WHO, in an effort to prevent and treat hypotension and hypertension can be done by increasing physical activity through exercise (Lapidaire et al., 2023; Veldman et al., 2020). Obesity in adolescents is characterised by a relatively high body weight compared to age or height of peers due to excessive fat deposition (Dwijayanti et al., 2023). Appropriate physical activities include walking, cycling, swimming, doing homework and aerobic exercise.

Regular aerobic exercise also helps to prevent chronic conditions or diseases, such as high blood pressure (hypertension) (Li et al., 2024; Smith et al., 2021). Aerobic exercise can increase the body's metabolic activity and oxygen demand. Aerobic exercise is very important for older people because it can help maintain a healthy body (Ezpeleta et al., 2023; Kern & Armstrong, 2022). Aerobic exercise can be divided into two types, high impact and low impact (Arfanda, 2023). The problem with this study is the difference between the effects of aerobic exercise and yoga on blood pressure in young adult women, and what are the differences in long-term effects between the two types of exercise? In addition, are there other factors to consider when choosing between low impact aerobic exercise and yoga for blood pressure management in young adult women?

Because the recommended activities for young adult women, one of which is low impact aerobic exercise, is a form of aerobic exercise (Dwijayanti, 2021). The implementation of low impact aerobic exercise is that both feet or one foot is always in contact with the ground, so that jogging movements are replaced by brisk walking movements (Espí-López et al., 2016; Shen & Chen, 2021). Aerobic exercise can affect heart rate and decrease cardiac output, ultimately leading to changes in blood pressure (Börjesson et al., 2016; Cornelissen & Fagard, 2005). An increase in cardiac work efficiency is reflected by a decrease in systolic blood pressure, while a decrease in peripheral resistance is reflected by a decrease in diastolic blood pressure (Da Roza et al., 2015).

Yoga is an ancient practice originating in India that combines physical movement, breathing, meditation and relaxation to promote physical, mental and emotional well-being (Field, 2016; Pascoe & Parker, 2022). Blood pressure is the pressure created by the flow of blood against the walls of the arteries as the heart pumps blood throughout the body (Morishima & Ochi, 2022; Naser et al., 2016; Nied & Franklin, 2002). The pressures measured are systolic (maximum pressure when the heart is contracting) and diastolic (minimum pressure when the heart is resting between contractions) (Kelley et al., 2001; Lawrence et al., 2023; Lewis et al., 2024). Many studies show that regular yoga practice can help lower blood pressure, both systolic and diastolic (Najafi & Moghadasi, 2017; Shiraishi & Bezerra, 2016). This is likely due to several factors, including the effects of physical and mental relaxation produced by yoga practice, as well as stress reduction and increased parasympathetic activity of the nervous system.

Yoga practices that involve gentle, controlled body movements, such as slow poses and deep breathing, can help reduce stress and tension in the body. Sympathetic nervous system activity is associated with the 'fight or flight' response, which can raise blood pressure. In addition, yoga can also help increase self-awareness and mental focus, which can help individuals cope with stress and overreaction to stressful situations. Helps keep blood pressure within a healthy range.

There is still a lack of public awareness about healthy living. Health insurance for underprivileged people is still not working well, so many people still struggle to get treatment when they get sick. So many complaints about maternal blood pressure, which can cause some low-risk diseases to become high-risk diseases. Based on direct observations by researchers, less physical activity is a risk for cardiovascular disease. Aerobic exercise and yoga can be adapted by people who rarely exercise, because aerobic exercise is performed at a rate of 138 to 144 beats per minute, which is slower than high-impact exercise. Yoga, on the other hand, places more emphasis on stillness.

The main objective of this study was to directly compare the effects of aerobic exercise and yoga on blood pressure in young adult women. By making this comparison, the study aimed to gain a better understanding of the differences in the effectiveness of these two types of exercise in lowering blood pressure in this population. However, this study also has a wider aim, which is to look at the long-term effects of both types of exercise. In terms of long-term effects, the study is expected to provide a more complete picture of the long-term health benefits of aerobic exercise and yoga in managing blood pressure in young adult women.

MATERIALS AND METHODS

This study used an experimental method (Asrin, 2022) with the design of two groups of 14 participants, each group of aerobic exercise and yoga. In addition, tests were conducted on the effectiveness of aerobic exercise and yoga on blood pressure in women. Test results were collected using a sphygmomanometer assessment tool, ambulatory blood pressure monitoring (ABPM) and electrocardiogram (ECG) heart rate monitoring. The sample consisted of randomly selected adult women, a total of 28 participants, with an age criterion of 30-40 years.

Ethical clearance (No.23/KEPK/RSI-U/IV/2024) for this research was obtained from the Research Ethics of Health Research Ethics Committee of Malang Islamic hospital, Malang City, East Java, Indonesia. Participant provided informed consent, with the volunteer form covering research details, risks, benefits, confidentiality, and participant rights. The research strictly adhered to the ethical principles of the Declaration of Helsinki, prioritizing participant's rights and well-being in design, procedures, and confidentiality measures.

The research process was conducted in the village of Nogosari, Boyolali regency, for two

months and included 12 sessions. Before the intervention began, baseline measurements were taken to establish a starting point and ensure that participants had similar health conditions. The participants were then randomly divided into two groups: an aerobic exercise group and a yoga exercise group. Each group underwent a predetermined training session over a period of time according to the specifics of the aerobic and yoga exercises. At the end of the intervention period, repeated measurements of blood pressure, heart rate and other parameters were taken from each participant. The data collected will be analysed using appropriate statistical methods to evaluate the effects of aerobic exercise and yoga.

Instrument validation using Principal Component Analysis (PCA) showed a strong correlation (0.894) between aerobic exercise and yoga. Reliability analysis using Cronbach's alpha yielded a value of 0.735, indicating good consistency. This study involved 28 participants of mothers with an average age of 30-40 years in Nogosari village, Boyolali regency, Central Java Indonesia.

Statistical Analysis

Statistical analysis is used to examine and present relevant information from a study or experiment. Some of the approaches tested are hypothesis testing, regression and correlation, analysis of variance (ANOVA), chi-square analysis and descriptive statistics.

Table 1. Fitness Level Questionnaire Of Aerobics And Yoga Group

Questionnaire	Score				
	1	2	3	4	5
How much aerobics/yoga do you do per week?					
What is your energy level during and after participating in a aerobics/yoga session?					
How effective do you feel the aerobics/yoga programme has been in improving your fitness?					
To what extent do you feel that this programme has improved your flexibility?					
How would you rate your muscle strength after doing this programme regularly?					
How well do you feel you have been able to control your weight by participating in this programme?					
How much do you feel your heart health has improved as a result of this programme?					
Do you feel that this programme helps to reduce your stress and anxiety?					
How well did you follow the instructor's instructions during this session?					
Do you feel motivated to continue with the programme?					

RESULTS

The initial design of the low impact aerobic and yoga group fitness questionnaire by calculating the reliability coefficient as an indicator of the internal validity of the data can be seen in Table 2. Furthermore, it was classified in Table 3 by comparing the correlation between several questions related to participation in low impact aerobic exercise sessions and yoga. The results of the analysis showed that most of the questions had good to very good validity, indicating a significant relationship between participation in both types of exercise and various aspects of health and fitness. However, the yoga category tended to have a slightly higher correlation than low impact aerobics, showing slightly greater consistency in participants' responses to questions in this category. A fairly wide range of correlations reflects the variation in the degree of relationship between the questions asked and the benefits derived from the exercise programme. A relatively high mean correlation and a relatively low standard deviation indicate that, overall, both types of exercise had a positive effect on participants' health and fitness.

The test results in Table 4 include blood pressure data from ambulatory blood pressure monitoring (ABPM) and electrocardiogram (ECG) tests for 28 samples. The ABPM blood pressure results show a systolic pressure range of 110 to 140 mmHg, with a mean of about 122 mmHg and a standard deviation of about 8,229 mmHg. The diastolic pressure range is from 70 to 95 mmHg, with a mean of about 86 mmHg and a standard deviation of about 6,745 mmHg. All ABPM blood pressure results are within the normal range. The blood pressure results in Table 5 were obtained from two groups participating in gymnastic activities. The first group did low impact aerobics and the second group did yoga. The blood pressure test results showed that the low impact aerobic group had a systolic pressure range of 130 to 160

mmHg, with a mean of about 144 mmHg and a standard deviation of about 9,959 mmHg. The diastolic pressure range was 80 to 93 mmHg, with a mean of about 88 mmHg and a standard deviation of about 4,141 mmHg. The yoga group had a systolic pressure range of 130 to 180 mmHg, with an average of about 144 mmHg and a standard deviation of about 13,523 mmHg. The diastolic pressure ranged from 70 to 95 mmHg, with an average of about 82 mmHg and a standard deviation of about 7,490 mmHg. All blood pressure results for both groups were within the normal range.

From the results of the ANOVA analysis in Table 6, it can be concluded that there is a significant influence of ABPM blood pressure on low impact aerobic exercise (p = 0.046). This indicates that the variable ABPM blood pressure has a significant effect on the results of low impact aerobic exercise. This may be due to a number of factors, including the influence of blood pressure on a person's energy level and fitness during physical activity. The results in Table 7 show that the regression coefficient for ABPM blood pressure was -0.392 with a significance level of 0.046. This shows that there is a significant negative relationship between ABPM blood pressure and the results of low impact aerobic exercise. In this context, the higher the ABPM blood pressure, the lower the low impact aerobic exercise results achieved.

The results of the ANOVA analysis in Table 8 showed that there was a significant effect of ABPM blood pressure on yoga practice (p = 0.033). This indicates that the variable of ABPM blood pressure has a fairly significant effect on yoga practice. The existence of this effect may be related to the way in which the practice of yoga can affect a person's blood pressure, both directly through the breathing and meditation techniques used in yoga, and indirectly through stress management and increased self-awareness. The results of Table 9 show that the regression coefficient for yoga practice is -0.179 with a significance level of 0.033. This indicates that there is a significant negative relationship between yoga practice and ABPM blood pressure. In this context, the more often a person practices yoga, the lower their ABPM blood pressure.

Table 10 shows the interaction between ABPM blood pressure and low impact aerobic exercise. From the table it can be seen that the adjusted model shows a significant influence of the interaction between ABPM blood pressure and low impact aerobic exercise on the results obtained (p = 0.048). This suggests that the effect of low impact aerobic exercise on a given outcome may be influenced by the ABPM blood pressure level of an individual. Table 11 shows the interaction between ABPM blood pressure and yoga practice on the yoga dependent variable. From the table it can be seen that the adjusted model shows a significant effect of the interaction between ABPM blood pressure and yoga practice on the outcomes achieved (p = 0.033). This suggests that the effect of yoga practice on a particular outcome may be influenced by a person's ABPM blood pressure level.

Table 2. Guidelines for giving the interpretation of correlation coefficients

Skor	Category	Correlation Coefficient
1	0,00 – 0,199	Very Low
2	0,20 – 0,399	Low
3	0,40 – 0,599	Medium
4	0,60 – 0,799	Good
5	0,80 – 1,000	Very Good

Table 3. Results of correlation coefficient questionnaire aerobic gymnastics low ımpact and yoga

Questionnaire	Correlation Coefficient	Senam Kategori	Correlation Coefficient	Yoga Kategori
How much aerobics/yoga do you do per week?	0,974	Very Good Validity	0,965	Very Good Validity
What is your energy level during and after participating in a aerobics/yoga session?	0,990	Very Good Validity	0,992	Very Good Validity

How effective do you feel the aerobics/yoga programme has been in improving your fitness?	0,920	Very Good Validity	0,937	Very Good Validity
To what extent do you feel that this programme has improved your flexibility?	0,645	Validity Is Quite Good	0,675	Validity Is Quite Good
How would you rate your muscle strength after doing this programme regularly?	0,913	Very Good Validity	0,909	Very Good Validity
How well do you feel you have been able to control your weight by participating in this programme?	0,263	Very Low Validity	0,695	Validity Is Quite Good
How much do you feel your heart health has improved as a result of this programme?	0,908	Very Good Validity	0,953	Very Good Validity
Do you feel that this programme helps to reduce your stress and anxiety?	0,931	Very Good Validity	0,924	Very Good Validity
How well did you follow the instructor's instructions during this session?	0,688	Validity Is Quite Good	0,654	Validity Is Quite Good
Do you feel motivated to continue with the programme?	0,932	Very Good Validity	0,918	Very Good Validity
Minimum	0,263		0,654	
Maximum	0,990		0,992	
Mean	0,816		0,862	
Std. Deviasi	0,226.579		0,131.962	

Table 4. Blood pressure test results ambulatory blood pressure monitoring

Sample	ABPM		ECG	Sample	ABPM		ECG
	Systolic	Diastolic			Systolic	Diastolic	
Sample 1	110	84	Normal	Sample 15	120	85	Normal
Sample 2	125	90	Normal	Sample 16	130	70	Normal
Sample 3	120	90	Normal	Sample 17	125	72	Normal
Sample 4	125	95	Normal	Sample 18	120	82	Normal
Sample 5	120	90	Normal	Sample 19	140	90	Normal
Sample 6	110	90	Normal	Sample 20	110	80	Normal
Sample 7	125	82	Normal	Sample 21	110	64	Normal
Sample 8	120	95	Normal	Sample 22	125	70	Normal
Sample 9	130	80	Normal	Sample 23	120	80	Normal
Sample 10	125	84	Normal	Sample 24	125	85	Normal
Sample 11	120	85	Normal	Sample 25	120	82	Normal
Sample 12	140	82	Normal	Sample 26	110	85	Normal
Sample 13	110	80	Normal	Sample 27	125	82	Normal
Sample 14	125	70	Normal	Sample 28	110	85	Normal
Minimum	110	70		Minimum	110	64	
Maximum	140	95		Maximum	140	90	
Mean	122	86		Mean	121	80	
Std. Deviasi	8.229	6.745		Std. Deviasi	8.739	7.480	

Table 5. Blood pressure results of aerobic exercise and yoga groups

Sample	Aerobic Exercise		ECG	Sample	Yoga		ECG
	Systolic	Diastolic			Systolic	Diastolic	
Sample 1	157	89	Normal	Sample 15	130	80	Normal
Sample 2	150	87	Normal	Sample 16	140	70	Normal
Sample 3	160	90	Normal	Sample 17	140	72	Normal
Sample 4	150	93	Normal	Sample 18	130	80	Normal
Sample 5	145	90	Normal	Sample 19	140	90	Normal
Sample 6	150	90	Normal	Sample 20	150	85	Normal
Sample 7	145	80	Normal	Sample 21	145	70	Normal
Sample 8	140	90	Normal	Sample 22	130	85	Normal
Sample 9	130	90	Normal	Sample 23	135	90	Normal

Sample 10	150	80	Normal	Sample 24	150	80	Normal
Sample 11	150	90	Normal	Sample 25	150	95	Normal
Sample 12	130	82	Normal	Sample 26	180	80	Normal
Sample 13	135	90	Normal	Sample 27	160	80	Normal
Sample 14	130	90	Normal	Sample 28	135	85	Normal
Minimum	130	80		Minimum	130	70	
Maximum	160	93		Maximum	180	95	
Mean	144	88		Mean	144	82	
Std. Deviasi	9.959	4.141		Std Deviasi	13.523	7.490	

Effect of aerobic exercise on the blood pressure measured by ABPM

Table 6. Anova test of aerobic exercise

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	198.341	1	198.341	3.490	.046[a]
	Residual	682.016	12	56.835		
	Total	880.357	13			

a. Predictors: (Constant), Blood pressure ABPM, b. Dependent Variable: Aerobic exercise

Table 7. Effect of ABPM on aerobic exercise

	Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	178.431	30.389		5.872	.000
	Blood pressure ABPM	-.392	.210	-.475	-1.868	.046

a. Dependent Variable: Low impact aerobic exercise

Effect of yoga on the blood pressure measured by ABPM

Table 8. Anova test of Yoga

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	78.478	1	78.478	1.030	.033[a]
	Residual	914.379	12	76.198		
	Total	992.857	13			

a. Predictors: (Constant), Blood pressure ABPM, b. Dependent Variable: Yoga

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Table 9. Effect of ABPM on Yoga

	Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	146.427	25.444		5.755	.000
	Yoga	-.179	.176	-.281	-1.015	.033

a. Dependent Variable: Yoga

Interaction between abpm blood pressure and aerobic exercise

Table 10. Interaction between ABPM blood pressure and aerobic exercise

Dependent Variable: Aerobic exercise

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	92.857[a]	4	23.214	.265	.048
Intercept	135309.091	1	135309.091	1.546E3	.000
ABPM	92.857	4	23.214	.265	.048
Error	787.500	9	87.500		
Total	208525.000	14			
Corrected Total	880.357	13			

a. R Squared = .105 (Adjusted R Squared = -.292)

Interaction between ABPM blood pressure and yoga

Table 11. Interaction between ABPM blood pressure and yoga

Dependent Variable:Yoga

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1026.762[a]	6	171.127	4.560	.033
Intercept	218093.432	1	218093.432	5.812E3	.000
ABPM	1026.762	6	171.127	4.560	.033
Error	262.667	7	37.524		
Total	293324.000	14			
Corrected Total	1289.429	13			

a. R Squared = .796 (Adjusted R Squared = .622)

DISCUSSION

The analysis shows the importance of taking blood pressure into account in low impact aerobic exercise programs because high blood pressure can be a risk factor that hinders the achievement of optimal results from physical activity (Thomas et al., 2023)Yoga has also been shown to be effective in managing blood pressure, and regular yoga practice can help lower high blood pressure (Yonglitthipagon et al., 2017). Individuals who are prone to hypertension and maintain a healthy heart may consider yoga as part of blood pressure management. The importance of taking into account individual factors such as blood pressure in designing an appropriate physical exercise program can have a positive impact on the health and fitness of the body (Nabo et al., 2021; Schütz et al., 2023). Health practitioners can optimize the benefits of low impact aerobic exercise by paying attention to individual health conditions, including blood pressure. A negative Adjusted R Squared value (-0.292) indicates that the model is less suitable for lowering pressure well. Therefore, further research is needed to understand more about the complex interaction between blood pressure and low impact aerobic exercise in achieving certain results. The practice of yoga against blood pressure gave mixed results from each sample. A high Adjusted R Squared value (0.622) indicates that the model is suitable for lowering blood pressure well. The results of the interaction between blood pressure and yoga practice are significant. However, while these results are exciting, more research is needed to understand the complex interactions between blood pressure and yoga practice in the context of overall health and wellness.

The findings highlight the importance of considering blood pressure when designing aerobic exercise programmes and yoga practices. The practice of yoga has been shown to be effective in the management of blood pressure, with significant reductions seen in those who practise regularly. The importance of incorporating yoga into a blood pressure management plan, especially for those at risk of hypertension or who wish to maintain heart

health, is highly recommended (Peng & Xie, 2021; Phansikar & Mullen, 2022). Low impact aerobic exercise programmes also have significant health benefits on blood (Heberle et al., 2021; Herrod et al., 2018; Lapidaire et al., 2023). The results of the analysis showed that the interaction between blood pressure and aerobic exercise is more complex. On the one hand, yoga practice demonstrates the importance of individual factors in physical activity when designing an appropriate exercise or yoga programme. This is consistent with modern medical thinking, which emphasises the importance of monitoring and managing blood pressure to maintain the health of the heart and the body as a whole (Muñoz-Vera et al., 2017; Thind et al., 2017) These findings suggest a significant association between blood pressure and certain physical activities, namely aerobic exercise and yoga practice. Several theories support this finding, namely that physical activity improves heart health (Denny Maurits et al., 2023; Loprinzi, 2016; Willinger et al., 2023). The effect of yoga practice on physiological responses, blood pressure, and the benefits of yoga in reducing stress correlate with increased blood pressure (Ghaffarilaleh et al., 2019; Moreno et al., 2023). Physiological aspects that apply to aerobic exercise.

The findings reflect the importance of blood pressure monitoring and management in maintaining overall heart and body health and emphasise the need to consider individual factors, including blood pressure, when designing an exercise or yoga programme that meets fitness principles. Thus, a holistic approach to health that integrates personalised physical activity and appropriate medical care can help prevent the risk of injury or health problems associated with high blood pressure.

Blood pressure plays an important role in health and fitness, particularly in relation to physical activity such as aerobic exercise and yoga practice. The findings suggest that regular yoga practice can effectively lower blood pressure, while the relationship between blood pressure and aerobic exercise may be more complex. This highlights the importance of taking individual factors, including blood pressure, into account when designing an exercise or yoga programme to suit individual health needs and conditions. Suggestions for future research include incorporating yoga into blood pressure management plans, especially for people at risk of hypertension or who want to maintain heart health. It is also necessary to monitor and manage blood pressure regularly to maintain the health of the heart and the body as a whole. More research is needed to understand the complex interactions between blood pressure and aerobic exercise in order to design more effective exercise programmes tailored to individual needs. Adopting a holistic approach to health that integrates personalised physical activity with appropriate medical care can help prevent the risk of injury or health problems associated with high blood pressure. By following these suggestions, individuals can maximise the benefits of physical activity and yoga in maintaining overall heart and body health while reducing the risk of hypertension and other related health conditions.

Conflict of Interest

The authors declare no conflict of interest. No financial support was received

Ethics Statement

Ethical clearance (No.23/KEPK/RSI-U/IV/2024) for this research was obtained from the Research Ethics of Health Research Ethics Committee of Malang Islamic hospital, Malang City, East Java, Indonesia

Author Contributions

Study Design, KD ; Data Collection, KD, ARH ; Statistical Analysis, KD, ARH, ADM and UN; Data Interpretation, KD, ARH and UN; Manuscript Preparation, ADM, UN, MF and HA; Literature Search, MF and HA. All authors have read and agreed to the published version of the manuscript

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