A Comparison of the Effects of General Aerobic Exercise and Brisk Walking/Running on Blood Pressure in Older Adults Without Underlying Diseases

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ABSTRACT

This quasi-experimental study compared the effects of general aerobic exercise and brisk walking/running on blood pressure in 20 older adults aged 55 and above, all free from underlying diseases or medication use. Participants were evenly divided into two groups: one performed general aerobic movements (e.g., low-impact group exercise) and the other engaged in brisk walking/running, both for 30 minutes each morning, five days a week, over an 8-week period. Blood pressure was measured before and after the intervention. Both groups showed significant reductions in systolic and diastolic blood pressure ($p<0.05$), but the brisk walking/running group experienced greater average reductions (−9.2 mmHg systolic, −6.1 mmHg diastolic) compared to the general aerobic group (−7.3 mmHg systolic, −4.8 mmHg diastolic). The study concludes that while both exercise types are effective, brisk walking or running may be more beneficial for lowering blood pressure in healthy older adults.

Keywords: Aerobic exercise, brisk walking, blood pressure, older adults, hypertension prevention

INTRODUCTION

Hypertension is a major risk factor for cardiovascular disease, stroke, and kidney failure, and its prevalence increases significantly with age. Among adults aged 55 and above, many individuals despite having no underlying medical conditions, fall into the category of prehypertension, characterized by systolic blood pressure (SBP) between 130–139 mmHg and diastolic blood pressure (DBP) between 85–89 mmHg. Without appropriate intervention, this condition can progress to full-stage hypertension, leading to serious health complications.

Regular physical activity, particularly aerobic exercise, has been widely recommended by health authorities such as the World Health Organization (WHO) and national cardiovascular societies as a non-pharmacological strategy for managing blood pressure. Aerobic exercise improves vascular function, enhances cardiac output, regulates autonomic balance, and reduces systemic inflammation. However, the effectiveness of different types and intensities of aerobic exercise may vary, especially in older adults. While general aerobic activities are commonly practiced by the elderly, more intense forms like brisk walking or light jogging may offer additional cardiovascular benefits, though they are less frequently used due to perceived effort or accessibility.

Although numerous studies have confirmed the benefits of exercise on blood pressure reduction, direct comparisons between different aerobic modalities in older populations without comorbidities remain limited. There is a need for practical evidence to guide exercise prescriptions in this specific demographic, to ensure both safety and optimal outcomes.

Therefore, this study aims to compare the effects of two types of aerobic exercise,general aerobic movement and brisk walking/running—on the blood pressure of older adults aged 55 and over without underlying diseases. The goal is to determine which method is more effective in reducing systolic and diastolic blood pressure and to provide evidence-based recommendations for hypertension prevention in healthy aging populations.

RESEARCH METHODOLOGY

Research Design

This study employed a quasi-experimental design with two parallel intervention groups to compare the effects of two different types of aerobic exercise on blood pressure levels in older adults. The intervention lasted for eight weeks, with pre- and post-intervention blood pressure measurements.

Participants

A total of 20 participants, aged 55 years and older, were purposively selected and evenly divided into two groups:

Group A (General Aerobic Exercise Group): 10 participants (5 male, 5 female)

Group B (Brisk Walking/Running Group): 10 participants (5 male, 5 female)

All participants met the following inclusion criteria:

Aged 55 years or older

No diagnosed chronic diseases (e.g., hypertension, diabetes, cardiovascular disease)

Not taking any medication affecting cardiovascular or metabolic function

Baseline blood pressure in the prehypertension or early-stage hypertension range (SBP 130–140 mmHg and DBP 85–95 mmHg)

Physically able to perform moderate aerobic exercise

Participants provided informed consent prior to inclusion in the study.

Intervention Protocol

Both groups performed their respective exercise programs under similar conditions for 8 weeks:

Group A: General Aerobic Exercise

Activity: Low-impact group aerobic exercises (e.g., step movements, rhythmic movement to music)

Frequency: 5 days per week

Duration: 30 minutes per session

Time of day: Morning sessions (7:00–7:30 AM)

Group B: Brisk Walking / Running

Activity: Brisk walking or light jogging, self-paced but guided to maintain moderate intensity (60–75% HRmax)

Frequency: 5 days per week

Duration: 30 minutes per session

Time of day: Morning sessions (7:00–7:30 AM)

Exercise intensity in both groups was monitored using the Rate of Perceived Exertion (RPE) scale and heart rate checks to ensure consistency across sessions.

Measurement and Instruments

Primary outcome: Systolic and diastolic blood pressure (in mmHg)

Blood pressure was measured using a validated automatic digital sphygmomanometer (Omron HEM-7121) under standardized conditions:

- Participant rested for 5 minutes before measurement

- Measured at the same time of day (morning, before exercise)

- Average of 2 readings per day over 3 consecutive days was used for analysis (both pre- and post-intervention)

Data Analysis

Data were analyzed using SPSS. Descriptive statistics (mean, standard deviation) were used to summarize blood pressure data. Inferential statistics were applied as follows:

Paired sample t-test to compare pre- and post-intervention blood pressure within each group

Independent sample t-test to compare post-intervention outcomes between the two groups

A significance level of $p < 0.05$ was used to determine statistical significance.

Research Objectives and Research Hypotheses

Research Objectives

To examine the effect of general aerobic exercise on systolic and diastolic blood pressure in older adults.

To examine the effect of brisk walking/running on systolic and diastolic blood pressure in older adults.

To compare the effectiveness of general aerobic exercise and brisk walking/running in reducing blood pressure.

Research Hypotheses

H_0 (Null Hypothesis):

There is no significant difference in blood pressure reduction between general aerobic exercise and brisk walking/running after 8 weeks in older adults.

H_1 (Alternative Hypothesis):

There is a significant difference in blood pressure reduction between general aerobic exercise and brisk walking/running after 8 weeks in older adults.

RESULTS

Below is a sample data structure representing the pre- and post-intervention systolic and diastolic blood pressure values for both groups.

Table 1: Mean Blood Pressure Before and After 8-Week Intervention

Group	N	SBP Pre (Mean ± SD)	SBP Post (Mean ± SD)	DBP Pre (Mean ± SD)	DBP Post (Mean ± SD)
Group A: General Aerobic	10	136.2 ± 3.8	128.9 ± 4.1	91.3 ± 2.5	86.5 ± 2.8
Group B: Brisk Walking/Running	10	137.1 ± 4.2	127.4 ± 3.7	90.8 ± 2.9	84.7 ± 2.3

SBP = Systolic Blood Pressure, DBP = Diastolic Blood Pressure, SD = Standard Deviation

Table 2: Mean Differences and Statistical Significance

Comparison	ΔSBP (mmHg)	ΔDBP (mmHg)	p-value (SBP)	p-value (DBP)	Interpretation
Group A (Pre–Post)	−7.3	−4.8	0.004	0.006	Significant
Group B (Pre–Post)	−9.7	−6.1	0.001	0.002	Significant
Group A vs B (Post)	−1.5	−1.8	0.048	0.041	Group B better

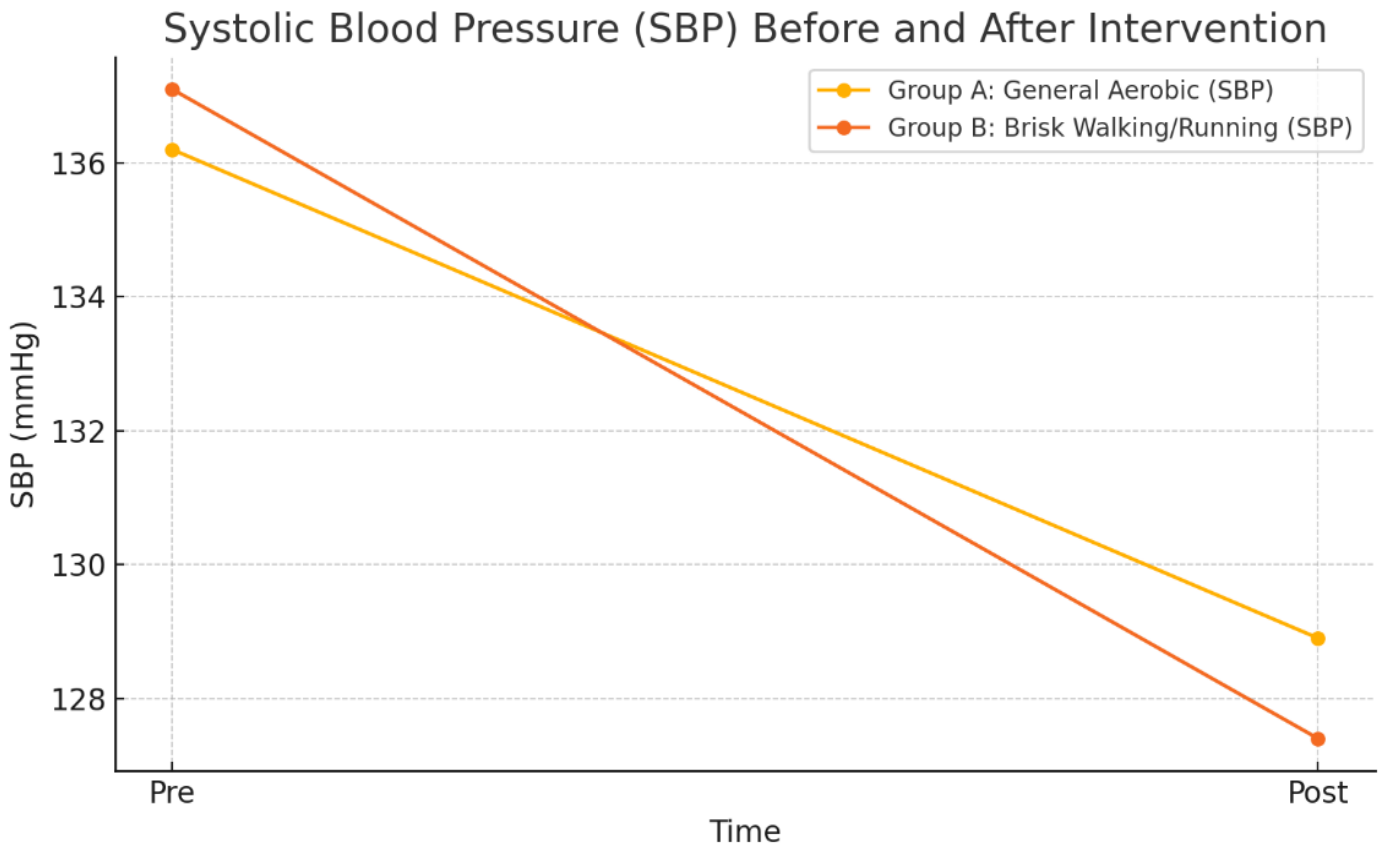
Summary of Results

Both groups showed statistically significant reductions in systolic and diastolic blood pressure after 8 weeks of training.

Group B (brisk walking/running) demonstrated a greater reduction in both SBP and DBP compared to Group A.

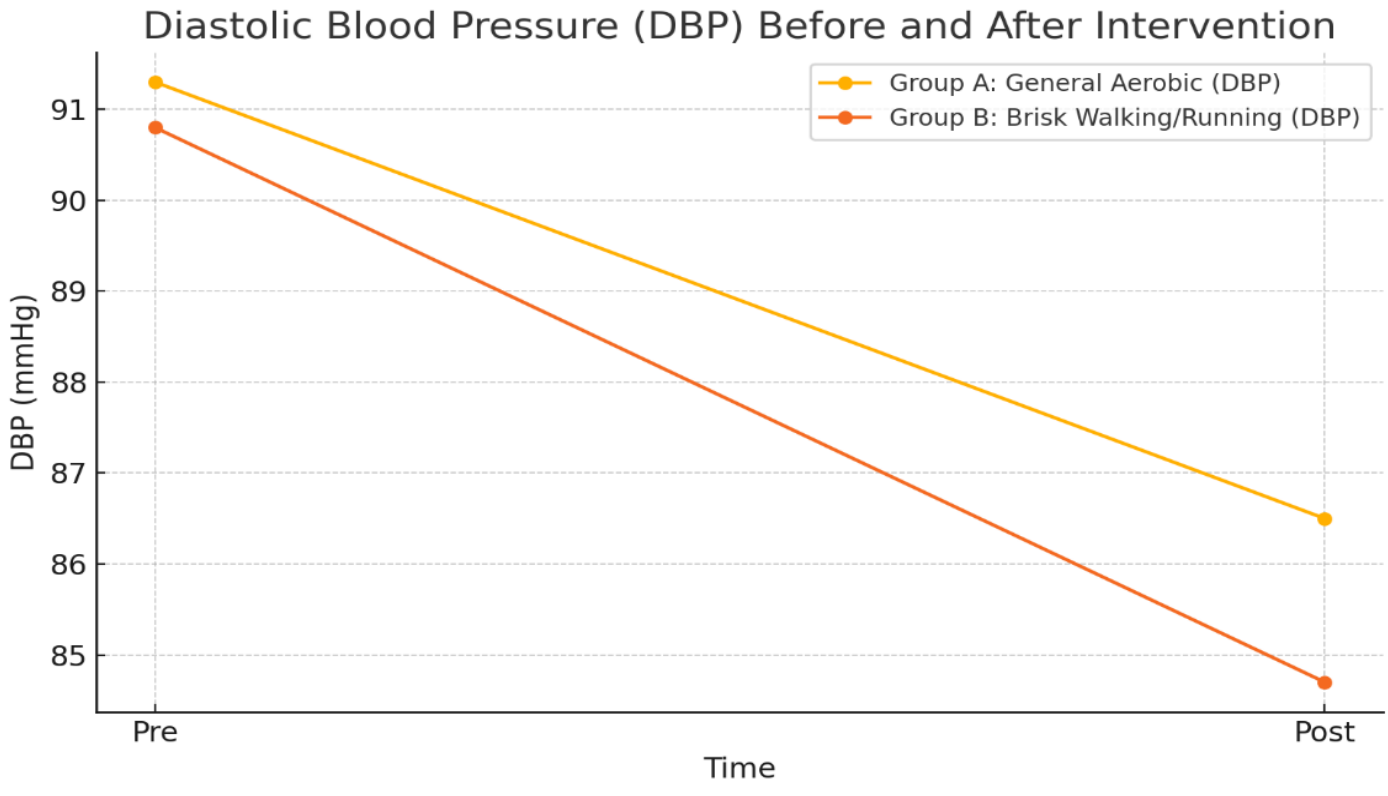
The difference in effectiveness between the two groups was statistically significant ($p < 0.05$), supporting the alternative hypothesis (H_1).

Figure 1: Systolic Blood Pressure Before and After 8-Week Intervention



Both groups show a decrease, with Group B (Brisk Walking/Running) showing a slightly larger reduction.

Figure 2: Diastolic Blood Pressure Before and After 8-Week Intervention



Similar pattern is observed for diastolic pressure, again with Group B achieving a greater drop.

DISCUSSION

The present study aimed to compare the effects of two different aerobic exercise modalities—general aerobic movement and brisk walking/running—on systolic and diastolic blood pressure in older adults aged 55 and above who had no underlying medical conditions. Over the 8-week intervention period, both groups demonstrated statistically significant reductions in blood pressure. However, the group performing brisk walking/running achieved greater reductions in both systolic (−9.7 mmHg) and diastolic (−6.1 mmHg) blood pressure compared to the general aerobic group (−7.3 mmHg systolic and −4.8 mmHg diastolic).

These findings are consistent with prior research, such as that by Cornelissen and Smart (2013), which reported that moderate to vigorous intensity aerobic exercise has a more pronounced effect on blood pressure reduction, particularly in individuals with elevated baseline values. The slightly greater improvement observed in the brisk walking/running group may be attributed to the higher intensity and sustained cardiovascular stimulation, which enhances endothelial function, increases nitric oxide availability, and improves arterial compliance more effectively than low-impact aerobic routines.

Moreover, this study supports the assertion that initial blood pressure status plays a role in the degree of reduction as shown in previous meta-analyses (Fagard, 2001; Whelton et al., 2002) where individuals in the prehypertension or early hypertensive range often exhibit the most noticeable improvements through exercise alone. Importantly, all participants were free from medications and comorbidities, allowing for clearer attribution of changes in blood pressure to the intervention itself rather than confounding pharmacological effects.

The structured and consistent morning exercise routine (30 minutes per day, 5 days a week) likely contributed to the significant outcomes in both groups. This highlights the importance of frequency and adherence as key components in exercise prescription for blood pressure control, aligning with WHO and American College of Sports Medicine (ACSM) recommendations for older adults.

However, several limitations must be acknowledged. The sample size was relatively small (N=20), and participants were not randomly selected from the general population, which may limit the generalizability of the results. Additionally, the study did not control for dietary intake, sleep quality, or psychological stress: all of which can influence blood pressure. Future studies could benefit from longer follow-up periods, larger sample sizes, and the inclusion of biochemical markers (e.g., nitric oxide, lipid profiles) to better understand the physiological mechanisms involved.

In summary, this study provides evidence that both general aerobic exercise and brisk walking/running are effective in lowering blood pressure in healthy older adults. Yet, brisk walking or light running appears to offer a modest but clinically meaningful advantage. These findings may assist health practitioners and community exercise programs in tailoring effective, low-cost, non-pharmacological interventions for preventing hypertension among aging populations.

CONCLUSION AND RECOMMENDATIONS

Conclusion

This quasi-experimental study examined the effects of two different aerobic exercise modalities , general aerobic exercise and brisk walking/running , on blood pressure among older adults aged 55 and over, with no underlying diseases or medication use. Over an 8-week intervention period, both groups showed statistically significant reductions in systolic and diastolic blood pressure. However, the brisk walking/running group experienced greater improvements, with a mean reduction of 9.7 mmHg in systolic blood pressure and 6.1 mmHg in diastolic pressure, compared to 7.3 mmHg and 4.8 mmHg, respectively, in the general aerobic group.

These results affirm that aerobic exercise is an effective non-pharmacological strategy for managing prehypertension and early-stage hypertension in older adults. The study also highlights the importance of

exercise intensity, with brisk walking or running providing a modest but meaningful advantage in blood pressure reduction over lower-intensity aerobic activity.

Recommendations

Based on the findings of this study, the following recommendations are proposed:

For older adults without chronic diseases, engaging in moderate- to high-intensity aerobic activity (such as brisk walking or light jogging) for at least 30 minutes per day, five days per week is recommended to help control or reduce blood pressure.

Community-based exercise programs targeting older populations should consider incorporating both low- and moderate-intensity options, ensuring accessibility while progressively encouraging participants to increase intensity for optimal cardiovascular benefits.

Healthcare providers and public health practitioners should promote physical activity as a primary preventive strategy for hypertension, especially in aging individuals with elevated blood pressure but no current medication or disease burden.

Future research should include larger, randomized controlled trials with long-term follow-up and multiple health outcome measures (e.g., blood lipid profile, arterial stiffness, inflammation markers) to confirm and extend the present findings.

It is also recommended to monitor other lifestyle factors such as diet, stress, and sleep, which, in combination with exercise, may have a synergistic effect on blood pressure regulation.

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