

A STUDY TO COMPARE THE EFFECTIVENESS OF CORE STRENGTHENING EXERCISES AND AEROBIC EXERCISES ON CARDIOVASCULAR FITNESS AND HAMSTRING FLEXIBILITY IN YOUNG ADULT OBESE PEOPLE

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ABSTRACT

Background of the Study: Obesity and overweight are characterized by an abnormal or excessive accumulation of fat in the body, which can lead to health risks such as cardiovascular diseases, osteoarthritis, and diabetes. Obesity develops gradually over time due to lifestyle changes, such as a lack of physical activity and a poor diet. It is associated with physiological changes that decrease cardiovascular fitness and flexibility, and there is a strong relationship between obesity and hypertension. Weight gain is linked to an increase in arterial pressure. A study aims to reduce weight and improve cardiovascular fitness and hamstring flexibility in young adult obese individuals by implementing core strengthening exercises and aerobic exercises.

Materials and Methodology: This study was carried out for 4 weeks among 20 young obese people who were selected based on inclusion and exclusion criteria and a simple random sampling technique. In this study, subjects between 18 to 25 years old, males and females, with a BMI of ≥ 25 kg/m² or 35 kg/m², were selected. Pre-reading and post-reading tests were taken by measuring body mass index, waist circumference, blood pressure, and a modified sit-and-reach test. The result of these tests were recorded before the study began and at the end of the fourth week. In this study, the twenty young adult obese people were divided into two groups, namely, Group A (n = 10) and Group B (n = 10). Group A individuals were given core strengthening exercises while Group B individuals were given aerobic exercises. The repetition of the exercises progressed every week.

Results: The two groups exhibited significant differences in cardiovascular fitness and hamstring flexibility before and after the interventions ($p < 0.05$). However, Group B demonstrated a greater increase in cardiovascular fitness and hamstring flexibility compared to Group A. The data analysis and results indicated that aerobic exercises led to improvements in weight reduction, cardiovascular fitness, and hamstring flexibility in young adults with obesity, as opposed to core strengthening exercises. With P values of < 0.0003 for Group A and < 0.0001 for Group B, it is evident that Group B is highly effective and statistically significant.

Conclusion: The study demonstrated significant results ($p < 0.05$), suggesting that aerobic exercises are more effective than core strengthening exercises in improving cardiovascular fitness and hamstring flexibility in obese individuals.

KEYWORDS: Obesity, overweight, core strengthening exercise, aerobic exercise, hamstring flexibility, cardiovascular fitness.

INTRODUCTION

Obesity and overweight are defined as abnormal or excessive fat accumulation that presents a higher health risk. It is one of the most serious global public health challenges of the 21st century, affecting every country. It can lead to poor health, early death, and some other serious health problems, including cardiovascular disease, diabetes, osteoarthritis, cancer, etc. Preventing obesity has direct benefits for health and well-being. The development of obesity is often gradual, stemming from prolonged unhealthy dietary habits and lifestyle choices, chiefly characterized by the over consumption of high-calorie, fatty, and sugary foods. Additionally, factors such as insufficient physical activity, genetic predispositions, inadequate sleep, stress, and certain medical conditions contribute to the onset of obesity. Individuals with moderate-to-severe obesity face a significant risk factor for heart disease, both directly and through associated risk factors like hypertension and coronary artery disease. Recent trends show that even young people are at higher risk for cardiovascular diseases and obesity due to sedentary lifestyles. This lack of physical activity not only contributes to obesity but also leads to reduced flexibility. Inadequate flexibility can cause issues like muscle injuries and tightness. Among individuals with obesity, the hamstring muscles are often the most affected due to a lack of physical activity. Improving flexibility through regular exercise and stretching routines can help prevent muscle-related problems and improve overall physical health. It is crucial for individuals, especially those with obesity, to prioritize physical activity and flexibility training to reduce the risk of heart disease and muscular issues associated with excess weight. Adopting a more active lifestyle can have significant benefits for both cardiovascular health and overall well-being.

PURPOSE OF THE STUDY

The purpose of this study is to determine the effectiveness of core strengthening exercises and aerobic exercises in young adult obese people, and this study helps to find out whether obese people need improved cardiovascular capacity and flexibility. The lack of flexibility is more common in obese people due to their sedentary lifestyle, and this can lead to other health-related hazards.

METHODOLOGY

The study included 20 obese subjects aged 18 to 25, selected using simple random sampling and meeting specific criteria. The subjects were divided into two groups: Group A (n = 10) for core strengthening and Group B (n = 10) for aerobic exercises. The 4-week protocol involved exercise sessions three times a week, with two sessions per day and home exercises on other days. The training program began with a 5-minute warm-up and ended with a 2-minute cool-down, followed by 1 hour and 10 minutes of core strengthening and aerobic exercises.

OUTCOME MEASURES

- **Body Mass Index:** BMI is an indicator of the amount of body fat that is present in the body and it is also used as a screening tool to identify whether an adult is at a healthy weight.
- **Blood Pressure:** Blood pressure is the measurement of the pressure or force of blood inside your arteries. Each time your heart beats, it pumps blood into arteries that carry blood throughout your body.
- **Modified Sit and Reach Test:** The sit and reach test is an important functional measure of hip region flexibility, including the lower back and hamstring muscles.

- **Waist Circumference:** Waist circumference can be used as a screening tool but is not diagnostic of the body fatness or health of an individual.

RESULT

The study assessed obesity, hamstring flexibility, and hypertension using body mass index (BMI), waist circumference (WC), modified sit and reach test (MSRT), and blood pressure (BP). Group A's mean pre and post-test values for BMI were 33.71 and 31.92, WC were 103.7 and 101.1, MSRT were 22.25 and 24.15, and BP were 101.77 and 99.54. For Group B, pre and post-test values were BMI 31.26 and 27.06, WC 101.45 and 97.51, MSRT 24.05 and 28.4, and BP 100.05 and 96.3. Group B showed significant improvement in cardiovascular fitness and flexibility ($P < 0.0001$) compared to Group A.

THIS TABLE SHOWS THE MEAN, STANDARD DEVIATION, 't' VALUE AND 'P' VALUE OF GROUP A

Table 1

VARIABLE	PRETEST	POST TEST	STANDARD DEVIATION	T VALUE	PVALUE
BMI	33.71	31.92	1.265	5.6576	<0.0003
WC	103.7	101.1	1.838	11.75	<0.0001
MSRT	22.25	24.15	1.343	28.50	<0.0001
BP	101.77	99.54	1.576	16.03	<0.0001

THIS TABLE SHOWS THE MEAN, STANDARD DEVIATION, 't' VALUE AND 'P' VALUE OF GROUP B

Table 2

VARIABLE	PRETEST	POST TEST	STANDARD DEVIATION	T VALUE	PVALUE
BMI	31.26	27.06	2.969	32.3	<0.0001
WC	101.45	97.51	2.786	21.14	<0.0001
MSRT	24.05	28.4	3.075	33.41	<0.0001
BP	100.05	96.3	2.651	19	<0.0001

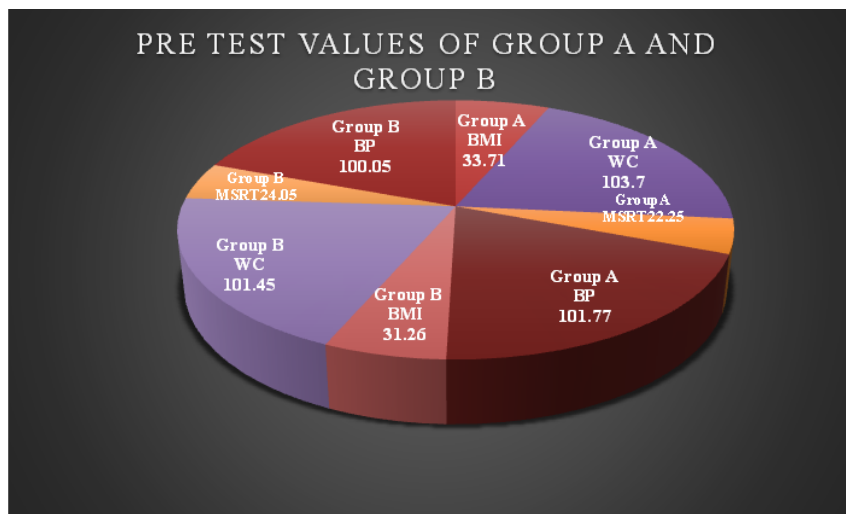


Figure 1

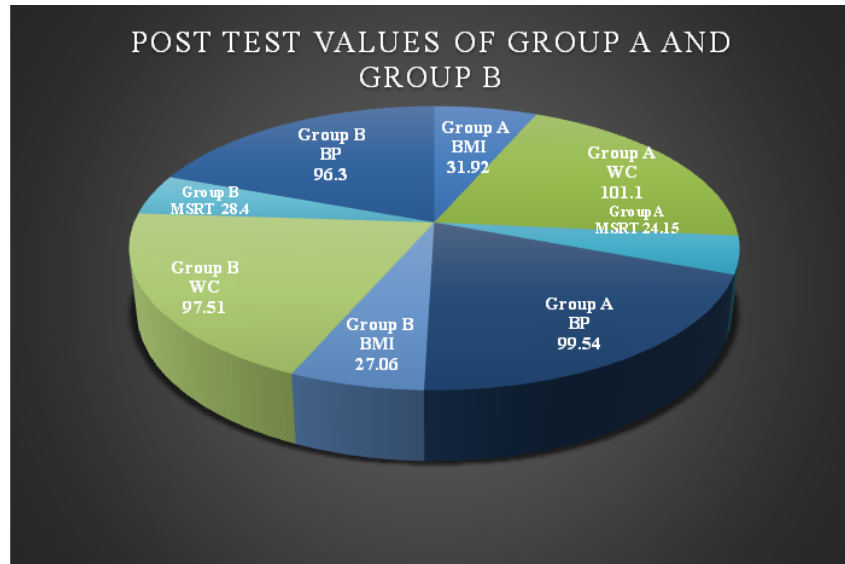


Figure 2

DISCUSSION

This study aimed to investigate the impact of overweight individuals on their cardiovascular fitness and hamstring flexibility, as well as to assess the effectiveness of core strengthening exercises and aerobic exercises in improving these aspects. The results revealed that the core strengthening group (Group A) showed minimal changes in BMI, WC, MSRT, and BP before and after the interventions. On the other hand, the aerobic exercise group (Group B) demonstrated significant changes in BMI, WC, MSRT, and BP before and after the interventions. It was observed that aerobic exercises were more effective in reducing overall body weight compared to core-strengthening exercises. This suggests that aerobic exercise is beneficial for weight reduction in obese individuals, as well as for reducing blood pressure and improving flexibility in this population.

CONCLUSION

The study found that individuals with a higher BMI tend to have lower cardiovascular and hamstring flexibility. By comparing core strengthening exercises and aerobic exercises in young adults with obesity, the study showed that aerobic exercises resulted in greater improvements in cardiovascular fitness and hamstring flexibility compared to core strengthening exercises.

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