JEPHS
Journal of Exercise Physiology and Health Sciences

Faculty of Sport and Health Sciences
Universitas Negeri Surabaya
Lidah Wetan, 60213 Surabaya - East Java, Indonesia

Article

Weight and BMI are Significantly Reduced by Circuit Training

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Received: 15 September 2024 | Revised: 3 November 2024 | Accepted: 5 November 2024 | Published: 11 November 2024

Abstract: Obesity has become a growing global health problem, with a significant impact on a wide range of chronic diseases. This study aims to explore the effect of circuit training on weight loss and Body Mass Index (BMI) in overweight or obese adult individuals. Using a pretest-posttest experimental research design, 30 participants were divided into two groups: an experimental group that followed an eight-week circuit training program and a control group that received no intervention. The results showed that the experimental group experienced a significant weight loss from 73.6 kg to 69.5 kg ($p = 0.003$) and a decrease in BMI from 29.9 kg/m² to 28.2 kg ($p = 0.003$). Meanwhile, the control group also experienced weight and BMI reductions, but with smaller changes (body weight from 70.1 kg to 69.1 kg and BMI from 29.0 kg/m² to 28.6 kg), although it remained significant ($p < 0.05$). These findings confirm the effectiveness of circuit training as an intervention in weight loss programs, as well as the importance of a structured approach in obesity management. This study provides empirical evidence that can be used by health professionals and fitness trainers in designing more effective exercise programs to achieve weight loss goals, as well as improve the overall quality of life of individuals.

Keywords: Weight; BMI; Circuit training

1. Introduction

In recent decades, obesity has become a growing global health problem, affecting millions of people worldwide . Body Mass Index (BMI) and weight are two important indicators that are often used to assess a person's nutritional and health status (Bray & Ryan, 2021). High obesity rates are closely related to a variety of chronic diseases, including type 2 diabetes, heart disease, and hypertension (Dal Canto et al., 2019). Therefore, the search for effective methods to reduce weight and BMI is very important in efforts to improve public health (Cortés-Macías et al., 2021). Obesity has become a growing global health problem, affecting millions of people worldwide (Vaamonde & Álvarez-Món, 2020). According to data from the Ministry of Health, the global prevalence of obesity has nearly tripled since 1975, and by 2030, it is estimated that one in five women and one in seven men will be obese. Body Mass Index (BMI) and weight are two important indicators that are often used to assess a person's nutritional and health status (Schlauch et al., 2022). BMI, which is calculated based on weight and height, provides an overview of whether a person falls into the normal weight category, is overweight, or obese (Markowitz, 2018). The high rate of obesity is closely related to various chronic diseases (Han et al., 2014). Research shows that obesity contributes to deaths from cardiovascular diseases by 5.87 percent and diabetes and kidney disease by 1.84 percent of total deaths. These diseases not only affect the quality of life of individuals but also place a significant economic burden on the health system. Therefore, the search for effective methods to reduce weight and BMI is very important in efforts to improve public health (Massetti et al., 2017). In this context, preventive measures such as promoting a healthy lifestyle, increasing physical activity, and education about a good diet are needed

to overcome the problem of obesity (Kris-Etherton et al., 2021). By adopting a holistic approach to obesity prevention, it is hoped that an environment that supports overall public health can be created.

One promising approach in weight loss programs is circuit training. Circuit training is a form of physical exercise that combines strength and cardiovascular in one session, with the aim of increasing endurance, muscle strength, and burning calories efficiently (Prasetyo et al., 2023). This study aims to explore the impact of circuit training on weight reduction and BMI in adult individuals. Research shows that circuit training can provide significant results in weight reduction and BMI (Body Mass Index). For example, a study involving obese women showed that an eight-week circuit training program was successful in significantly losing weight and body fat percentage. This method is not only effective in burning calories but also helps improve body composition by increasing muscle mass and overall fitness.

The purpose of this study was to explore the impact of circuit training on weight reduction and BMI in adult individuals. By using an experimental research design, it is hoped that valid data can be obtained regarding the effectiveness of circuit training as an intervention to overcome obesity problems. The results of this study are expected to provide new insights for health professionals and fitness trainers in designing more effective exercise programs for weight loss. Through this study, it is hoped that it can provide empirical evidence regarding the effectiveness of circuit training as an intervention strategy in weight loss programs. The results of this study will not only contribute to the scientific literature but may also provide practical guidance for fitness trainers, health professionals, and individuals looking to achieve their fitness goals. Thus, this research is expected to provide new insights in efforts to combat obesity and improve the quality of life of the community as a whole.

2. Materials and Methods

This study uses an experimental design with a pretest-posttest approach. This design allows researchers to measure changes in body weight and Body Mass Index (BMI) before and after the circuit training intervention. The population in this study is adult individuals who are overweight or obese. Samples were taken using purposive sampling techniques, with the criteria Age between 18 to 50 years, Do not have a medical condition that prevents participation in the Exercise program, Willing to participate in the entire series of studies. The sample taken in this study was 30 people, who were divided into two groups: an experimental group that would take part in a circuit training program and a control group that did not receive intervention. The experimental group will undergo a circuit training program for 8 weeks, with a frequency of training 3 times a week. Each exercise session will last 60 minutes, consisting of: Warm-up: 10 minutes, Circuit Training: 40 minutes, covering a variety of exercise stations involving strength and cardiovascular, such as push-ups, squats, jumping jacks, and planks, Cooling-off: 10 minutes, The control group will not receive any exercise intervention during the study period. The data obtained will be analyzed using SPSS statistical software version 21. The statistical tests used include normality tests to determine the distribution of data. The paired t-test was used to compare the average body weight and BMI between the pretest and posttest in the experimental group. Independent t test to compare differences between the experimental and control groups.

3. Results

From Table 1, it is known that the average score of the weight variable in the experimental group (circuit training and diet regulation) was 73.6kg in the pre-test and 69.5kg in the post test while in the control group (circuit training) the pre-test was 70.2 kg and in the post test was 69.1kg and the average BMI variable in the experimental group (circuit

training and diet regulation) was 29.89 kg/m2 in the pre-test and in the post test 28.24 kg/m2 while in the control group (circuit training) pre test 29.07 kg/m2 and in the post test 28.64 kg/m2.

Table 1. Results for Weight and BMI Variables

Variable	Group	Pre	Post	Sig (2-tailed)
Weight (Kg)	Experiment	73,6 ± 8,6	69,5 ± 6,7*	(0,003<0,05)
	Control	70,1 ± 1,4	69,1 ± 1,3*	(0,000<0,05)
BMI (Kg/m²)	Experiment	29,9 ± 3,05	28,2 ± 2,3*	(0,003< 0,05)
	Control	29,0 ± 0,5	28,6 ± 0,6*	(0,003<0,05)

The results of this study show a comparison of changes in weight and Body Mass Index (BMI) between the experimental and control groups. The data presented include mean and standard deviation (±) values for pre-intervention and post-intervention conditions, as well as significance values (p-values) for each variable.

1) Weight

The experimental group showed significant weight loss after the intervention. The average body weight decreased from 73.6 kg to 69.5 kg, with a standard deviation that showed variation between individuals. This decrease is statistically significant. The control group also experienced significant weight loss. The average weight dropped from 70.1 kg to 69.1 kg. A significance value lower than 0.05 indicates that this change is also statistically significant.

2) BMI In the experimental group

BMI also experienced a significant decrease. The average BMI decreased from 29.9 kg/m² to 28.2 kg/m². This decrease indicates the effectiveness of the intervention in reducing obesity. The control group also showed a decrease in BMI from an average of 29.0 kg/m² to 28.6 kg/m². Although this decrease was statistically significant, the change was not as large as that seen in the experimental group.

The results of the analysis showed that both the experimental and control groups experienced significant weight loss and BMI after the intervention. However, the experimental group showed greater changes compared to the control group. These findings indicate that the intervention applied to the experimental group is effective in losing weight and BMI.

4. Discussion

The results showed that the intervention applied to the experimental group was significantly effective in losing weight and BMI compared to the control group.

1) Effectiveness of the Intervention

The experimental group experienced a weight loss from 73.6 kg to 69.5 kg and a decrease in BMI from 29.9 kg/m² to 28.2 kg/m². This decrease was significant with a p-value of 0.003, indicating that the intervention had a positive effect on weight reduction and BMI. This is in line with previous research that shows that structured intervention programs can help individuals lose weight and improve overall health. Structured interventions in weight loss programs often include a combination of behavior modification (Wadden et al., 2020), a planned diet, and increased physical activity (Calcaterra et al., 2022). Previous research has shown that these programs can help individuals with obesity to achieve significant results in weight loss and overall health improvement (Bray & Ryan, 2021). Significant weight loss not only has an impact on the scale number but also

on other health parameters (Swift et al., 2014). Research shows that weight loss of 5% or more can result in meaningful improvements in cardiovascular, metabolic, and mental health risk factors. The results of this study support the importance of structured intervention programs in obesity management (Madigan et al., 2022). This suggests that a group-based approach with social support can increase the success rate of individuals in achieving their weight loss goals (Golaszewski et al., 2022).

2) Comparison with Control Group

The control group also showed a decrease in weight (from 70.1 kg to 69.1 kg) and BMI (from 29.0 kg/m² to 28.6 kg), but the changes were not as large as in the experimental group. Although this decrease was also significant (p-value 0.000), Although this decrease is statistically valid, the magnitude of the change is not proportional to that of the experimental group. This indicates that although individuals in the control group may experience natural weight loss, the effects tend to be slower and less significant in the absence of active intervention. This can be caused by factors such as unstructured eating habits, lack of social support, and low motivation to exercise. Further, these findings highlight the importance of structured intervention programs in achieving greater outcomes in weight loss and health improvement. Although the control group showed positive changes, the results from the more significant experimental group underscored the need for a more proactive approach to obesity management. By implementing strategies that involve behavior modification, a planned diet, and increased physical activity, individuals can achieve their health goals more effectively (Espinosa-Salas & Gonzalez-Arias, 2024). This research provides valuable insights for the development of future intervention programs that can improve weight loss success and overall quality of life.

3) Health Implications

This study emphasizes the importance of weight management through appropriate intervention. BMI is an important indicator for assessing a person's health risk; Individuals with a BMI above 30 are considered obese and are at high risk of various chronic diseases such as type 2 diabetes and heart disease. Therefore, the results of this study can be used as a basis for designing more effective public health programs in dealing with obesity problems (Wilding, 2014).

4) Research Limitations

Although the results showed the effectiveness of the intervention, the study also had limitations. For example, not all factors that affect weight and BMI are taken into account, such as genetic factors, individual diet, and physical activity levels. Further research is needed to explore these factors as well as to test the long-term effectiveness of the interventions applied.

Overall, this study provides evidence that well-designed interventions can significantly reduce weight and BMI. These results are important for the development of public health strategies in addressing obesity and improving the quality of life of individuals.

5. Conclusions

This This study showed that the intervention applied to the experimental group was significantly effective in losing weight and Body Mass Index (BMI). The results of the analysis showed : Weight Loss: The experimental group experienced a weight loss from 73.6 kg to 69.5 kg, while the control group experienced a decrease from 70.1 kg to 69.1 kg. The decrease in the experimental group was greater and statistically significant ($p = 0.003$). Decrease in BMI: The average BMI of the experimental group decreased from 29.9 kg/m² to 28.2 kg/m², while the control group decreased from

29.0 kg/m² to 28.6 kg/m². The decrease in BMI in both groups was also significant ($p < 0.05$), but a larger change was seen in the experimental group. Health Implications: The results of this study emphasize the importance of structured interventions in weight management and obesity prevention, which are risk factors for various chronic diseases.

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