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Original Article

Effect of Punching Bag Exercises on Body Mass Index (BMI)

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ABSTRACT

Background: The increasing global prevalence of obesity and overweight conditions necessitates effective physical activity interventions for weight management. Punching bag exercises, utilized in martial arts and boxing, offer a combination of aerobic and strength training, which could be beneficial for Body Mass Index (BMI) reduction. This study aims to investigate the impact of a structured punching bag exercise regimen on BMI among young adults.

Objective: The primary objective of this study was to assess the effectiveness of a six-week punching bag exercise program in reducing the BMI of university students.

Methods: The study was designed as a six-week experimental intervention, involving 30 undergraduate students (37% male, 63% female) with an average age of 24.42 ± 0.631 years, randomly selected from various institutions. Participants engaged in a punching bag exercise regimen on alternating days. Each session comprised four rounds of three-minute exercises with one-minute breaks between each round, totaling 15 minutes per session. BMI was measured weekly throughout the program. Data were analyzed using SPSS-21 software, with descriptive statistics and paired t-tests applied for statistical evaluation.

Results: The study commenced with an average BMI of 25.67 kg/m^2. Week-by-week analysis revealed a consistent decrease in BMI: 25.63 kg/m^2 in the second week, 25.22 kg/m^2 in the third week, 25.13 kg/m^2 in the fourth week, 24.36 kg/m^2 in the fifth week, and 24.11 kg/m^2 in the sixth week. Statistically significant reductions in BMI were observed in the fifth ($p = 0.038$) and sixth weeks ($p = 0.011$), compared to the baseline.

Conclusion: The six-week punching bag exercise regimen resulted in a significant reduction in BMI, particularly notable in the final weeks of the intervention. These findings suggest the potential efficacy of punching bag exercises in BMI management and weight reduction strategies among young adults.

Keywords: Punching Bag Exercises, Body Mass Index, Obesity, Weight Management, Physical Activity, Exercise Regimen.

INTRODUCTION

The global increase in overweight and obesity, now declared a global epidemic by the World Health Organization, poses significant health risks, including the development of type 2 diabetes and cardiovascular diseases (1-3). This trend, initially predominant in developed countries, has spread alarmingly to developing nations. Pakistan, for example, now ranks among the top countries in the world for obesity prevalence. The use of Body Mass Index (BMI) to assess body weight has long been accepted, yet the appropriateness of BMI classifications for Asian populations has been debated. This has led to suggestions for lower BMI cut-offs in these groups (4, 5).

Physical Activity (PA) plays a critical role in weight maintenance and overall health. Alterations in postprandial circulating appetite hormones through PA can lead to reduced hunger and food intake. Furthermore, PA can influence brain systems involved in food reward processing (6-9). Studies using functional magnetic resonance imaging (fMRI) have shown that exercise training and acute exercise reduce responses to high-calorie food cues in brain regions associated with reward and memory. This relationship between PA and reduced neural reactivity to food stimuli underscores the importance of physical exercise in managing overweight and obesity (10-13).

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In this context, punching bag exercises, which are designed to develop striking power in martial arts and boxing, also provide significant aerobic and strength training benefits. These exercises, involving a continuous and powerful series of hits and blows, could be particularly effective in weight management and health improvement. However, it is recommended to use special wraps to protect the skin during training. The versatility of these exercises, encompassing improvements in striking, kicking, and other martial arts techniques, indicates their potential as a comprehensive approach to physical activity (14-16).

The impact of such exercises on overweight and obesity is particularly pertinent. Regular PA, which may lead to weight loss, improves various cardiometabolic risk factors, including lipid profiles, insulin sensitivity, arterial stiffness, c-reactive protein levels, and resting blood pressure (17-19). These improvements are critical for lowering cardiovascular risk in overweight and obese patients. Despite the known benefits of PA, the specific impact of punching bag exercises on BMI and cardiometabolic health in overweight and obese individuals remains underexplored. This research gap highlights the need for focused studies on the efficacy of punching bag training as a tool for weight management and health improvement in these populations (20-22).

Given the escalating challenge of obesity and its varied impacts across nations and ethnic groups, understanding the role of specific forms of physical activity like punching bag exercises becomes increasingly important. This research could provide valuable insights into effective strategies for addressing the global obesity epidemic, particularly in countries like Pakistan, which face the dual challenge of underweight and overweight populations (23, 24).

MATERIAL AND METHODS

The study was designed as an experimental investigation to assess the effects of punching bag exercises on Body Mass Index (BMI) among undergraduate students. A random selection process was employed to recruit 30 participants aged between 18 and 26 years from various institutes and universities. These individuals expressed an interest in the exercise research and subsequently met with the researcher for a detailed briefing about the study.

The exercise protocol consisted of a six-week punching bag regimen, conducted on alternating days. Each participant's BMI was recorded prior to the commencement of the exercise sessions. The workout sessions were structured to include four rounds of three-minute exercises, interspersed with three one-minute breaks, totaling 15 minutes per session. This format was chosen to maximize the efficacy of the workout while ensuring participant safety and compliance.

Participants who reported extensive experience in heavy bag workouts, those engaged in regular aerobic activities (three or more times a week), or those involved in strenuous strength training were excluded from the study. This exclusion criterion was established to ensure a homogeneous sample less likely to exhibit pre-existing conditioning that could influence the study's outcomes. Additionally, individuals with a high risk for cardiovascular disease were excluded to prioritize participant safety.

Data collection occurred at the end of each week throughout the six-week period. This approach allowed for the monitoring of changes in BMI over time, providing insights into the effectiveness of the punching bag exercise regimen. The collected data were analyzed using SPSS-21 software, a standard in statistical analysis. Descriptive statistics were employed to summarize the frequency and characteristics of the study population. A paired t-test was applied to assess the significance of changes in BMI before and after the exercise regimen, providing a robust statistical framework to evaluate the efficacy of the intervention.

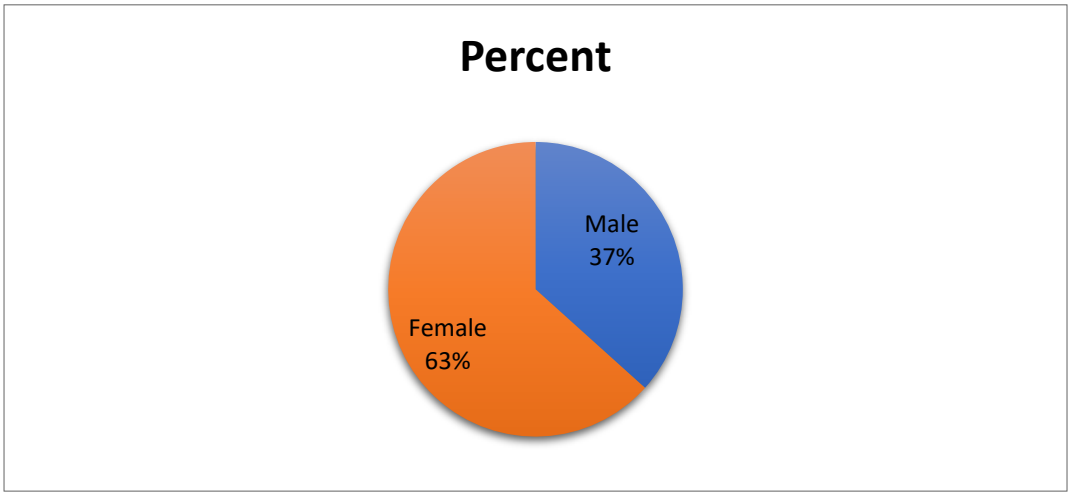

Figure 1 Gender of participants

RESULTS

A total of 30 male and female participants were included in the research, out of thirty 37% were male and 63% were female shown in Figure 1, with a mean age of 24.42 ± 0.631.

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Table 1 shows the comparison of week-wise BMI values from the first to last week, the first-week value of BMI was 25.67, tin he second week the value of BMI was 25.63 kg/m2, in the third week was 25.22 kg/m2, in the fourth week BMI was 25.13 kg/m2, the fifth week BMI was 24.36 kg/m2 and in the sixth-week value of BMI was noted 24.11 kg/m2.

Table 1 Comparison of week-wise BMI values

	BMI Value (kg/m2)		BMI Value (kg/m2)	p-value
First Week	25.67	Second Week	25.63	0.321
First Week	25.67	Third Week	25.22	0.253
First Week	25.67	Fourth Week	25.13	0.066
First Week	25.67	Fifth Week	24.36	0.038
First Week	25.67	Sixth Week	24.11	0.011

In the comparison of the first week and the second week, the first week to the third week and the first week to the fourth week, the result was found insignificant.

DISCUSSION

In the context of professional boxing, weight classes play a crucial role in ensuring fair competition by matching opponents of similar stature and body weight. The sport of boxing, rich in tradition and culture, particularly in its approach to bodybuilding, employs a unique weigh-in method known as "drying", typically used in the days leading up to competitions. Studies on amateur boxers have shown significant weight loss, around 3–4 kg, in the week prior to a competition, highlighting the intensive methods used to meet weight class requirements.

The effectiveness of boxing techniques, especially punching, relies heavily on dynamic, short actions requiring substantial muscle strength in both the upper and lower limbs. This emphasizes the importance of physical strength in high-level boxing performance. However, the relationship between exercise and obesity has often been examined in a limited scope. For instance, the study by Witham and Avenell focused exclusively on participants aged 60 years and above, thus limiting its applicability to a broader population (25). Similarly, a meta-analysis by Türk et al. concentrated solely on high-intensity exercise in randomized controlled trials (RCTs) with obese patients aged 18 to 60 years, without considering the varying aspects of the exercise regime such as intensity, time, frequency, and duration (21).

The aforementioned meta-analysis found that high-intensity training was more effective than moderate exercise in reducing body fat percentage in obese adults, a finding supported by some recent studies but not universally. Another study by Keating et al. revealed that high-intensity interval training (HIIT) can improve fitness in significantly less time compared to continuous aerobic training (CONT) (11). However, it was noted that while the CONT group experienced a reduction in total body fat, the HIIT group did not see similar results.

These findings underscore the complexity of the relationship between exercise type, intensity, and obesity management. They suggest that while high-intensity workouts might be efficient in certain aspects, they may not always lead to a reduction in body fat (26). This highlights the need for a nuanced understanding of how different exercise regimes impact weight management and body composition, especially in the context of specific sports like boxing where weight management is crucial.

CONCLUSION

The study's findings highlight the multifaceted nature of exercise's impact on body composition and weight management, particularly in sports like boxing where weight classes are crucial. While high-intensity training, such as that employed in boxing, can be effective in improving overall fitness, its effects on body fat reduction are not uniform across all exercise types. The research suggests that while high-intensity interval training (HIIT) improves fitness efficiently, it may not always lead to a decrease in total body fat, unlike continuous aerobic training (CONT), which has shown more consistent results in this regard. This discrepancy underscores the importance of tailoring exercise programs to individual needs, especially for those seeking specific health outcomes like body fat reduction. These insights have significant implications for sports professionals, trainers, and health practitioners, emphasizing the need for a personalized approach in prescribing exercise regimes for weight management and overall health improvement.

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