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Swiss Ball Training Interventions: Body Composition Modifications in Overweight Adults

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Abstract: ***The objective of this study was to determine the impact of specific Swiss ball exercises on the body composition of overweight individuals. A sample of 30 overweight males aged 20 to 30 years was taken from the general population of the Gwalior area in Madhya Pradesh, India. The selected subjects were categorised into two groups: 15 participants in the Swiss ball abdominal exercise group (Experimental) and 15 in the Control group. The present study employed a purposive - random selection strategy to choose the sample. The Body Composition Analyser and the WHO's BMI standards table were utilised to measure body fat percentage. The BMI was readily computed using the subsequent formula. BMI = (Weight in kilogrammes / Height in meters squared). Following the evaluation of the pre - test for both groups, a Swiss ball workout program was implemented for a duration of 12 weeks as part of the experimental treatment. Following the conclusion of 12 weeks of Swiss ball abdominal exercise training, a post - test measuring body fat percentage was administered to determine the significant differences between the Swiss ball abdominal exercise group and the control group. The t - test was employed to evaluate the data. The Swiss ball abdominal workout group demonstrated a statistically significant improvement in body fat percentage in experimental group II compared to control group I at the 0.05 level of significance.***

Keywords: Body Composition, Swiss Ball Exercise, BMI, Overweight People, Body Composition Analyzer

1. Introduction

Obesity is a serious health issue that can aggravate a number of conditions, such as type II diabetes, hypertension, obstructive sleep apnea (OSA), and chronic joint arthritis. . (Rush, 2004) Numerous health conditions, including cardiovascular diseases (heart disease and stroke), type 2 diabetes, several types of cancer, musculoskeletal ailments, and respiratory problems, can be brought on by obesity. . (Lam et al., 2023) . Humans naturally have some body fat. To maintain the energy reserves needed to handle everyday life, even the most fit people require some fat. Although eating well is obviously an indication of fertility and health, we now live in a totally different environment where ailments are linked to excess body fat. At the heart of the dilemma are the sharp rises in the prevalence of cardiovascular and diabetic conditions.

The higher incidence of chronic diseases and the requirement for medical treatment also put a significant strain on healthcare systems. There are a number of reasons why adult obesity is more common, particularly among working - age women. . (Harris et al., 2021)

Exercise is a crucial step in the fight against obesity. Numerous aerobic exercise forms have been employed, including walking, running, aerobic dancing, and cycling. (Voulgari et al., 2013)

Health issues among the old have been acknowledged as a significant issue that requires attention from the government, families, and the elderly themselves, since the growing number of elderly people is turning into a social issue. . (Hyun Cha et al., 2012)

Exercise balls are perfect for people of various body types because they come in a range of sizes. It may be more comfortable for obese persons to use an exercise ball than other types of exercise, especially if they have problems twisting and bending. An exercise ball is a terrific starting tool if you need to lose a heavy amount of weight. Before starting a new workout regimen, see your physician.

When combined with a low - calorie diet, using an exercise ball for 15 minutes can help a 300 - pound person burn almost 100 calories, which contributes to weight loss. If your size prevents you from moving through your entire range of motion, using an exercise ball can help you become more flexible, which will make it simpler to add more exercises to your programme. You are more likely to utilise a ball if you dislike exercising because it may be more enjoyable than more conventional kinds of exercise. Your core muscles get toned and strengthened as you sit on an exercise ball, which enhances your balance for other types of training.

2. Methodology

Subjects:
For the study's objective, 15 men were designated as the control group and 15 as the experimental group, engaging in Swiss ball abdominal exercises, picked from several gyms in the Gwalior region of Madhya Pradesh, India. The purposive sampling strategy was employed to pick the subjects. The age group spanned from 20 to 30 years.

Variable and Instrument
The body composition analyser and the WHO's BMI guidelines table were utilised to measure body fat percentage. The BMI was readily computed using the subsequent formula. BMI = (weight in kilogrammes / height in meters squared) The fifteen - week training program focused on Swiss ball abdominal exercises was executed systematically.

Twelve Weeks Exercise Programme of Selected Exercise on Experimental Group

Category	Swiss ball abs Exercise
Beginner (4 Weeks)	Ball Crunch, Elevated Ball Crunch, Ball Reverse Crunch, Sit - ups, V - ups, Knee - Up Leg Raises Reverse Crunches, Bench Reverse Crunches, Hip elevations utilising a ball, Bent - leg hip lifts, knee rises.
Intermediate (4 Weeks)	Ball Side Crunch, Ball Sit - Up, Ball Jackknife. Hanging knee rises with a ball, alternating hanging knee raises. Seated Twists, Lateral Bends with Resistance Leg - spread crunches with a ball
Advanced (4 Weeks)	Ball Abs Rollout, Ball Table top, Ball Bridge T Fall - Off, Suspended Knee Elevations Interspersed with continuous motion, Standing Twists: Bent - over position, Ball toe touches, Complete sit - ups: Elevated feet, Roman Chair sit - ups.

Note: 1. Warm - up, walking and Running on tread mill, Diet planning, Cooling - down, stretching exercise were selected as a limitation.
2. As training programme had been continues we would increase load

3. Procedure

To determine body fat percentage, the individuals were separated into two equal groups: 15 in the control group and 15 in the experimental group. Body fat percentage was assessed using a Body Composition Analyser and the BMI standards established by the WHO. The BMI was readily computed using the following formula. **BMI = (Weight in kilogrammes / Height in meters squared)**

The training for group II was carried out for a period of twelve weeks after the pre - test evaluation and after the experimental treatment, while the control group did not get any training. In order to determine whether or not there was a significant difference between the two groups (the control group and the Swiss ball abs exercise group), a post test was carried out after the exercises with the Swiss ball abs had been completed for a period of twelve weeks. In order to do the analysis of the data, the t - test was utilised. To examine the effects of specific Swiss ball Abs exercise training on the percentage of body fat in individuals who were overweight, the t test was utilised. For additional information, the level of significance was established at 0.05 levels.

4. Results

Table 1: Significance of difference pre - test (Body fat Percentage Score) between Control and Swiss ball Abs Exercise Group

Group	Mean	S. D	t - ratio
Control group	23.13	1.44	**0.90**
Swiss Ball, Abs group	24.07	1.42	

Significant at 0.05 level t 0.05 (28) = 2.048

It is observed from table 1 that the calculated ‘t’ (0.12) is less than the tabulated ‘t’ (2.048). Hence, it may be consider that there was no significant difference found between the control group and Swiss ball abs exercise group on the pre test scores of body fat percentage.

Table 2: Significance of difference Post - test (Body fat Percentage Score) between Control and Swiss ball Abs Exercise Group

Group	Mean	S. D	t - ratio
Control group	22.94	1.83	**3.62***
Swiss Ball, Abs group	20.72	1.49	

Significant at 0.05 level t 0.05 (28) = 2.048

Table - 2 reveals that there was significant difference found between the Control group and Swiss ball abs experimental group on the post test scores of body fat percentage at 0.05 level of significance because the calculated’t’ (3.62*) is more than the tabulated 't' (2.048).

Table 3: Significance of difference (Body fat Percentage Score) between Pre - test and Post - test of Control Group

Group	Mean	S. D	t - ratio
Pre - test body fat percentage Control group	24.13	1.44	**1.97**
Post - test body fat percentage Control group	22.94	1.84	

Significant at 0.05 level t 0.05 (28) = 2.048

It is observed from table - 3 that the calculated ‘t’ (1.97) is less than the tabulated ‘t’ (2.048). Hence, it may be considered that there was no significant difference found in body fats percentage between pre - tests and post - test of Control group at 0.05 level of significance.

Table 4: Significance of difference (Body fat Percentage Score) between Pre - test and Post - test of Swiss ball Abs Exercise Group

Group	Mean	S. D	t - ratio
Pre - test body fat percentage Swiss Ball, Abs Exercise group	24.07	1.42	**6.27***
Post - test body fat percentage Swiss Ball, Abs Exercise group	20.72	1.49	

Significant at 0.05 level t 0.05 (28) = 2.048

It is observed from table - 4 that the calculated ‘t’ (6.27*) is more than the tabulated ‘t’ (2.048). Hence, it may be considered that there was significant difference found in body fats percentage between pre - test and post test of Swiss ball abs group at. .05 level of significance.

5. Discussion

The results indicate no significant difference in pre - test body fat percentage scores between the Control group and the Swiss ball abs training group. The results indicated no significant difference in body fat percentage scores between the pre - test and post - test of the Control group. However, regarding the 12 weeks of Swiss ball exercise training, a significant difference was observed in the post - test body fat percentage scores between the Control group and the Swiss ball abdominal exercise group. The Control group exhibited no improvement, however the Swiss ball abdominal workout shown significant enhancement due to its higher caloric expenditure compared to the Control group. The Swiss ball abdominal workout engages all muscle groups and maximises calorie expenditure due to its targeted impact on specific areas of body fat. Upon the conclusion of a 12 - week period.

By the Swiss ball abs exercise training the body fats percentage was improved (reduced in body fats percentage) in comparison to Control group. So their performance with respect to Swiss ball abs exercise training was found to be significant because by the 12 weeks Swiss ball abs exercise training. Research confirmed scientifically that Swiss Ball abs exercise training programme more effective on reducing body fat percentage of overweight person.

6. Conclusions

It was determined that there were substantial similarities observed between the Control group and the Swiss ball abs workout group on pre - test scores as measurements of body fat %. This conclusion was reached within the constraints of the study. By the end of the twelve - week Swiss ball abs training experiment on the Experiment group, it was determined that the results were positive. When compared to the control group, the overall result demonstrated that the effect of a particular Swiss ball abs workout had a substantial impact on the percentage of body fat in the experimental group.

References

[1] Harris, K. M., Majmundar, M. K., & Becker, T. (Eds.) (with Committee on Rising Midlife Mortality Rates and Socioeconomic Disparities, Committee on Population, Committee on National Statistics, Division of Behavioral and Social Sciences and Education, & National Academies of Sciences, Engineering, and Medicine). (2021). *High and Rising Mortality Rates Among Working - Age Adults*. National Academies Press. https: //doi. org/10.17226/25976

[2] Hyun Cha, N., Ju Seo, Eun, & and Sok, S. R. (2012). Factors influencing the successful aging of older Korean adults. *Contemporary Nurse*, *41* (1), 78–87. https: //doi. org/10.5172/conu.2012.41.1.78

[3] Lam, B. C. C., Lim, A. Y. L., Chan, S. L., Yum, M. P. S., Koh, N. S. Y., & Finkelstein, E. A. (2023). The impact of obesity: A narrative review. *Singapore Medical Journal*, *64* (3), 163. https: //doi. org/10.4103/singaporemedj. SMJ - 2022 - 232

[4] Rush, E. (2004). WHO. World Health Organization (WHO) Expert Consultation: Appropriate body - mass index for Asian populations and its implications for policy and intervention strategies. Lancet 363, 157 - 163. *The Lancet*, *363*, 157–163. https: //doi. org/10.1016/s0140 - 6736 (03) 15268 - 3

[5] Voulgari, C., Pagoni, S., Vinik, A., & Poirier, P. (2013). Exercise improves cardiac autonomic function in obesity and diabetes. *Metabolism - Clinical and Experimental*, *62* (5), 609–621. https: //doi. org/10.1016/j. metabol.2012.09.005