

EFFECT OF SWISS BALL CIRCUIT TRAINING AND COMBINED TRAINING ON ANAEROBIC CAPACITY OF COLLEGE MEN STUDENTS

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ABSTRACT

The purpose of the study is to examine the effect of swiss ball, circuit training and combined training on anaerobic capacity of college men students. Sixty men college students selected to participate in the study. The selected students were taken from Tamilnadu state. Their age ranged between 18 years to 23 years. They were randomly divided in to four groups and each group consisted of fifteen subjects. The data collected from the four groups prior to and post experimentation were statistically analyzed to find out the significant difference if any, by applying the analysis of covariance (ANCOVA). Whenever the obtained 'F' ratio value was found to be significant for adjusted post test means, the Scheffe's test was applied as post hoc test to determine the paired mean differences, if any. The result stated that significant differences among the subjects of experimental groups and control group on anaerobic capacity. Even though swiss ball training group executed better performance than the other experimental groups.

Key Words: Swiss Ball, Circuit Training and Anaerobic Capacity.

Introduction

The ball is also recognized by a variety of other names, for example: birth ball, balance ball, body ball, gym ball, fitness ball, gymnastic ball, physio ball, pilates ball, Pezzi ball, stability ball, Swedish ball, Swiss ball, therapy ball, or yoga ball. The physical object identified as a "Swiss Ball" was developed in 1963 by Aquilino Cosani, an Italian plastics manufacturer. He developed a process for moulding large puncture-resistant plastic balls (Flett, 2003). According to American physical therapist Joanne Posner-Mayer, the use of the exercise ball as a therapy tool most likely begins with the Swiss pediatrician Dr. Elsbeth Kongan, an early advocate of the Bobath concept (Craig, 2001). Those balls, then known as "Pezzi balls", were first used in treatment purpose for newborns and infants by Mary Quinton, a British physiotherapist working in Switzerland.

The Swiss ball allows a range of exercises that are based on the ability of the user to move with the motion of the ball while performing the exercise, using the ball to both support the body during the movement as well as to provide a measure of resistance to the muscles employed in the movement. The classic Swiss ball exercises involve the abdominal muscles,

with corresponding responses from the groin and the stabilizers of the lower back, the oblique muscles that run parallel to the spine above the pelvis. The athlete, positioned on top of the Swiss ball, can take the abdominals through a complete range of motion through the performance of crunches (a motion that brings of the upper thighs and the sternum toward one another, to strengthen the abdominals); twisting crunches, where the upper body twists in opposite directions during the crunch to extend the muscular effect across the abdomen; and the flexion of the thoracic spine, the vertebrae of the mid-back to improve overall flexibility.

A primary benefit of practicing with an exercise ball as opposed to exercising directly on a hard flat surface is that the body reacts to the unsteadiness of the ball to remain balanced, attractive many more muscles (Vera, 2000). Those muscles become stronger over time to keep balance. Some dumbbell exercises, such as dumbbell fly can be performed on a ball (Demoss, 2021). Ball exercises are popular among runners. Circuit training is ideal for both advanced athletes and beginners because it can be scaled to the ability of the athlete. Circuit routines are fast, effective and fun. Popular for decades, circuit training was usually conducted on old universal machines where exercisers went from station to station for a pre-determined number of reps, or time, until all exercises were completed. Often the exercises were single jointed, isolated movements performed sitting down on a universal-type machine.

Methodology

The purpose of the study is to examine the effect of swiss ball, circuit training and combined training on anaerobic capacity of college men students. Sixty men college students selected to participate in the study. The selected students were taken from Tamilnadu state. Their age ranged between 18 years to 23 years. They were randomly divided in to four groups and each group consisted of fifteen subjects. Anaerobic capacity was assessed by sprint fatigue test. The data collected from the four groups prior to and post experimentation were statistically analyzed to find out the significant difference if any, by applying the analysis of covariance (ANCOVA). Whenever the obtained 'F' ratio value was found to be significant for adjusted post test means, the Scheffe's test was applied as post hoc test to determine the paired mean differences, if any.

Training Protocol

The experimental group performed the swiss ball, circuit and combined training programs three sessions per week on alternative days for 12 weeks. The swiss ball training program was a total body workout consisting of 14 exercises 3 to 6 sets of 6-10 repetitions that trained all the major muscle groups. The intensity fixed by the heart rate reserve (HRR) and started from 45 to 70%, and number of sets and repetitions performed for each exercise changed once in two weeks. The circuit training consists of 8 exercise-stations each exercise executed 30 seconds and rest 30 seconds between the exercises, for 3 to 6 sets of 10 repetitions. The intensity fixed by the heart rate reserve (HRR) and started from 45 to 70%, and number of sets and repetitions performed for each exercise changed once in two weeks. Combined training group undergone the both swiss ball and circuit training group's training schedules.

Results

Table-I
EXPERIMENTAL AND CONTROL GROUP RESULTS ON
ANAEROBIC CAPACITY

	Pre Test Mean & SD		Post Test Mean & SD		Adjusted Post Test Mean	
Swiss Ball	7.04	0.35	6.87	0.35	6.86	
Circuit Training	6.98	0.44	6.15	0.96	6.67	
Combined Training	7.08	0.51	6.69	0.49	6.75	
Control Group	7.14	0.54	7.10	0.53	6.99	
SoV	Between	Within	Between	Within	Between	Within
Sum of Squares	0.106	11.04	8.85	20.94	10.24	22.28
df	3	56	3	56	3	55
Mean Squares	0.035	0.197	2.95	0.37	3.41	0.40
Obtained 'F' Value	0.17		7.97*		8.52*	

Required Table $F_{0.05}$ df (3,56) : 2.77 df (3,55) : 2.77 * Significant

Table shows that the pre test means of anaerobic capacity of swiss ball training group was 7.04, circuit training group was 6.98, combined training group was 7.08 and control group was 7.14. The obtained F value of 0.17 was less than the required F value of 2.77 to be significant at 0.05 level. Hence, it was found that there was no significant difference among the means of the four groups at the beginning stage. The post test means of anaerobic capacity of swiss ball training group was 6.87, circuit training group was 6.15, combined training group was 6.69 and control group was 7.10. The obtained F value of 7.97 was higher than the required F value of 2.77 hence, the mean differences were significant. Taking into consideration of the pre and post test means, adjusted means were computed and the adjusted means anaerobic capacity of swiss ball training group was 6.86, circuit training group was 6.67, combined training group was 6.75 and control group was 6.99. The obtained F value of 8.52 was greater than the required F value of 2.77 to be significant at 0.05 level. Hence, it was found that the adjusted mean differences among the experimental groups and control group were significant.

Since significant F value was obtained, the results were further subjected to post hoc analysis using Scheffe's test. The results were presented in Table 2.

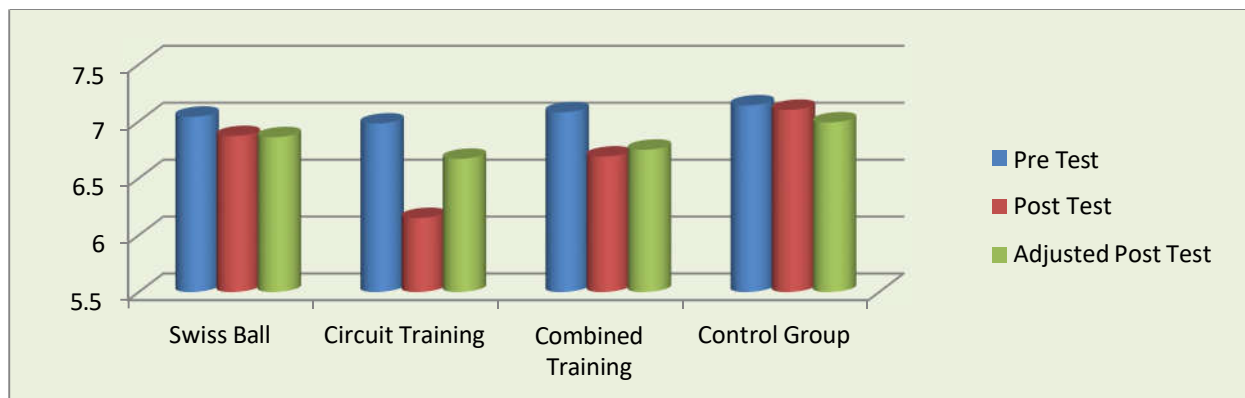
Table 2

Multiple Comparisons at Adjusted Pairs of Means of Experimental and Control Group on Anaerobic Capacity

Adjusted Means of				MEAN DIFFERENCE	Reqd. C.I
Swiss Ball Training	Circuit Training	Combined Training	Control Group		
6.86	6.67			0.19	0.65
6.86		6.75		0.11	0.65
6.86			6.99	0.13	0.65
	6.67	6.75		0.08	0.65
	6.67		6.99	0.32	0.65
		6.75	6.99	0.24	0.65

* Significant

The multiple comparisons of the adjusted pairs of means presented in Table on anaerobic capacity showed that there was no significant difference between swiss ball group and circuit group (MD 0.85), combined group (MD 0.79), control group (MD 1.16); circuit group and combined group(MD 0.06); circuit group and control group(MD 2.01); combined group and control group(MD 1.95), was lower than the required value of 0.65 to be significant at 0.05 level. Even though combined group executed better performance than the other experimental groups. The obtained pre, post and adjusted means of the groups are presented through a bar diagram for better understanding of the results of this study in Figure I.



Discussion

The result was found that differences among the subjects of experimental groups and control group due to the effect of swiss ball training, circuit training and combined training on anaerobic capacity. Even though combined training group executed better performance than the other experimental groups. The following studies are supporting the present results. Hameed and Jesudoss (2019) found out the relative effects of Swiss ball and medicine ball training on agility of college students. The Swiss ball and medicine ball training had significantly improved the participants' agility of college students. Ramkrishna and Bujurke (2019) investigated was intended to discover the impact of helped and opposed preparing on

Anaerobic Power execution of competitors. They demonstrated consolidated helped and opposed preparing bunch was found to have more noteworthy effect on the gathering worried than the helped preparing gathering, opposed preparing gathering and control amass in upgrading the execution of Anaerobic Power. Rumpf and others (2016). Examined the effect of different sprint training methods on sprint performance over various distances. The implementation of nonspecific training methods (e.g., strength and power training) could also benefit speed and athletic performance.

Conclusion

The conclusion was found that differences among the subjects of experimental groups and control group due to the effect of swiss ball training, circuit training and combined training on anaerobic capacity. Even though combined training group executed better performance than the other experimental groups.

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