EFFECT OF SWISS BALL TRAINING ON SELECTED PHYSICAL FITNESS PARAMETERS OF TENNIS PLAYERS

Mr.Yerukala Narendra[1] and Dr.K.Usha Rani[2]

[1]Ph.D Research Scholar, Department of Physical Education and Health Sciences, Alagappa University, Karaikudi, Tamilnadu, India
[2]Professor, Department of Physical Education and Health Sciences, Alagappa University, Karaikudi, Tamilnadu, India

Abstract:

Background: Swiss Ball training is a famous form of therapeutic and purposeful exercise. Despite their popularity, few empirical research have investigated the advantages of Swiss Ball training in relation to sports activities performance. **Method:** Therefore the purpose of the study was to investigate the effect of swiss ball training on Speed, Muscular endurance, and Flexibility of tennis players. In this study thirty (30) subjects, of tennis players were randomly selected in swiss ball training group and in non swiss ball group, fifteen (15) in each group. (n=30; age 14 ± 3.04; height 1.68 ± 6.64 cm; weight=58 ± 7.36 kg). **Timeline:** The swiss ball training consisted of 45-60 min/day, 3 days in a week till twelve weeks from the tennis academy in and around the Hyderabad in Telangana. Physical fitness variables completed of the both groups at zero time and after twelve weeks of swiss ball training in experimental group and except swiss ball training intervention in non swiss ball group. **Results:** In present study, Speed (10.22), Muscular endurance (11.17) and Flexibility (18.71) were changed significantly. **Conclusion:** Tennis is a sport that entails multidirectional motion patterns that challenge the capacity to keep dynamic stability. Tennis players want a stable core to efficaciously perform upper and lower extremity movements. The swiss ball training program introduced in this report accommodates the physical fitness speed, muscular endurance and flexibility vital for effective tennis performance. Research findings shows that the swiss ball training has a positive effect on physical fitness of the school tennis players. Therefore swiss ball training covered in this study are beneficial for the tennis players.

Keywords: Tennis Player, Paired ‘t’ test, Physical Fitness, Swiss Ball.

Introduction:

Interest in core steadiness coaching and the use of Swiss balls has improved dramatically in current times. Historically, the Greek logician Galen wrote that workout with a ball "is capable to provide the most extreme exercising and the gentlest relaxation (Sweet., 1987). Since the late 1980s, education programs outlining the advantages of Swiss ball training have seemed in both the therapeutic and athletic conditioning sectors (Fuller., 2002). Proponents of Swiss ball training argue that such training enhances neuromuscular pathways, leading to greater strength, proprioception, and balance (Check., 1999). Hence, Swiss balls are commonly used in both athletic therapy and conditioning settings (Bartonietz., 1998). Suggest adaptations from Swiss ball training are likely to result in better coordination of synergistic and stabilizer muscles. However, while anecdotal evidence from training journals and the popular press suggests Swiss ball training is effective, there is little empirical data available to support the efficacy of Swiss ball training (Rutherford and Jones 1986).

The modern game of tennis has evolved from a primary technical sport with sport-specific technical skills being the predominant factors (e.g., racket and ball handling skills and stroke skills, such as service skill), to a more dynamic and explosive sport characterized by higher stroke and serve velocities and requiring notably higher physical demands (Sanz-Rivas et al., 2009). Therefore, it is widely accepted that players require higher levels of physical fitness to execute advanced shots and compete effectively against progressively more elite opponents (Mendez et al., 2009). In this regard, it has been suggested that tennis players require a mix of speed, agility, coordination, and power, combined with medium-to-high aerobic and anaerobic capacity. Thus, successful performance cannot be defined by one predominant physical attribute; rather, tennis demands a complex interaction of several physical components and metabolic pathways (Kovas., 2007). In tennis, only a few studies have addressed physical testing for high-level young players (Girard., 2009). with the aim of identifying the most influential factors on tennis performance (i.e., ranking), and research has been conducted with athletes of various backgrounds (e.g., age, gender, performance level) using different testing protocols (Birrer 1986)

Thus, the aim of the present study was to scientific investigation into the effect of Swiss ball training on physical fitness performance of tennis player.

Methodology:

A sample of male junior tennis players (n=30; age 14 ± 3.04; height 1.68 ± 6.64 cm; weight=58 ± 7.36 kg) was evaluated. For the purpose of the present study, the players age ranged on 14-16 years categories tennis players. Randomized controlled pre and posttest design was used for the study. Subjects divided two groups as swiss ball training group (n=15), and control group (n=15). Subjects separated two groups randomly method. From 2019 to 2020, a sample of the 30 best male tennis players in Hyderabad (from the schools of Telangana) was evaluated using a physical fitness variables speed was measured by 50 meters run test (Allanstall, 1980) unit of measurement in seconds, muscular endurance was measured by sit-ups test (Allanstall, 1980) unit of measurement in points and flexibility was measured by sit and reach test (w.Earle, 2008) unit of measurement in centimeters. The swiss ball training consisted of 45-60 min/day, 3 days in a week till twelve weeks from the tennis academy in and around the Hyderabad in Telangana. Physical fitness variables completed of the both groups at zero time and after twelve weeks of swiss ball training in experimental group and except swiss ball training intervention in non swiss ball group.

Training protocol:

Swiss ball training exercise intervention consisted of 45-60 min exercise namely; Pelvic Rock, Side Stretch, Groin Stretch, Abdominal Stretch, Upper Body Russian Twist, Lower Body Russian Twist, Squat Push Press, Standing Torso Twist, Bend & Reach, 2-Legged Bridge, Supine Hip Extension- Knee Flexion, Prone Hip Extension, Seated Posture Trainer, Supine Hip Extension- back on ball, Oblique Crunch, Back extension, Forward ball roll, Supine lateral roll back, Upper abdominal crunch, Warm up exercises: Hamstring stretch, Quadriceps stretch, Chest stretch, Shoulder stretch.

Statistical analysis:

The data were analysed using statistical package for social sciences (SPSS) for windows version 16.1. Paired t-test was carried out between swiss ball training and control groups. To find out significance difference between the means of pre and post test of the groups and are presented in table I & II.

Table-I

TABLE SHOWING COMPARISON OF DIFFERENCE IN PRE TREATMENT AND POST TREATMENT SCORES AMONG SWISS BALL TRAINING.

Variable	Test	Mean	Mean Difference	Std. Error of the mean	DF	't'	Table value
Physical Fitness Variables							
Speed	Pre test	7.05	0.96	0.96	14	10.22*	
	Post test	6.09					
Muscular Endurance	Pre test	31.20	10.66	0.77	14	11.17*	**2.145**
	Post test	41.86					
Flexibility	Pre test	20.33	9.47	0.81	14	18.71*	
	Post test	29.80					

** Significant at 0.05 level for the degrees of freedom 1 and 14, 2.145*

Table I suggests the obtained 't' values of the swiss ball training group on criterion measure of 10.22 (speed), 11.17 (muscular endurance), 18.71 (flexibility). The obtained 't' values to be significant at 0.05 level for degree of freedom 1, 14 the required critical value was once 2.145. Hence the obtained 't' values on the selected criterion variables greater than the required critical value, it was concluded that the swiss ball training programme produced enormous improvement mean difference.

Figure 1:

Bar diagram showing the pre, post means values of swiss ball training group (SBTG) on Speed, Muscular endurance and Flexibility.

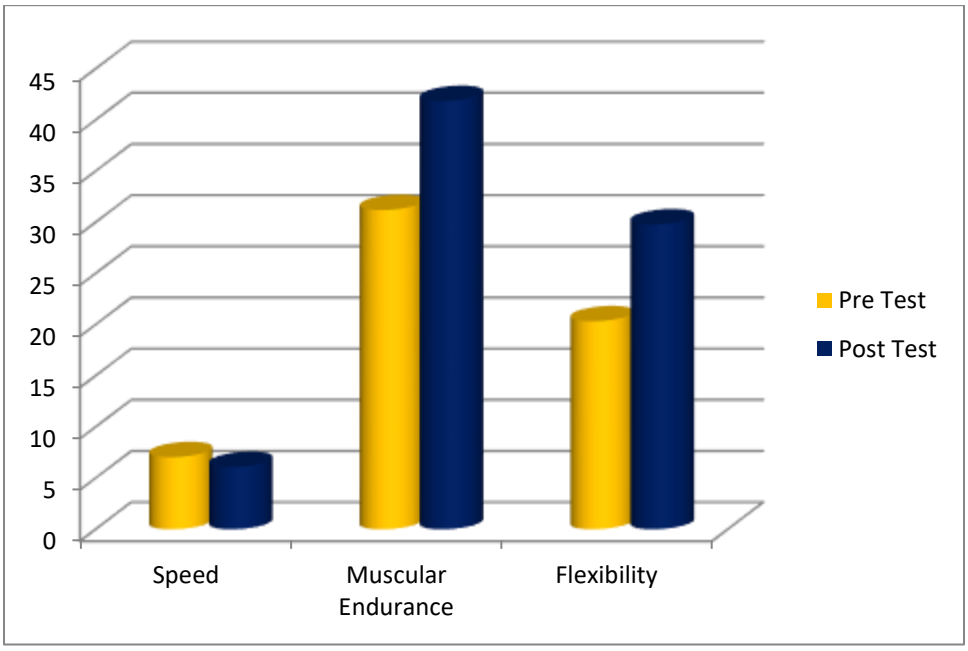


Table-II

TABLE SHOWING COMPARISON OF DIFFERENCE IN PRE TREATMENT AND POST TREATMENT SCORES AMONG CONTROL GROUP.

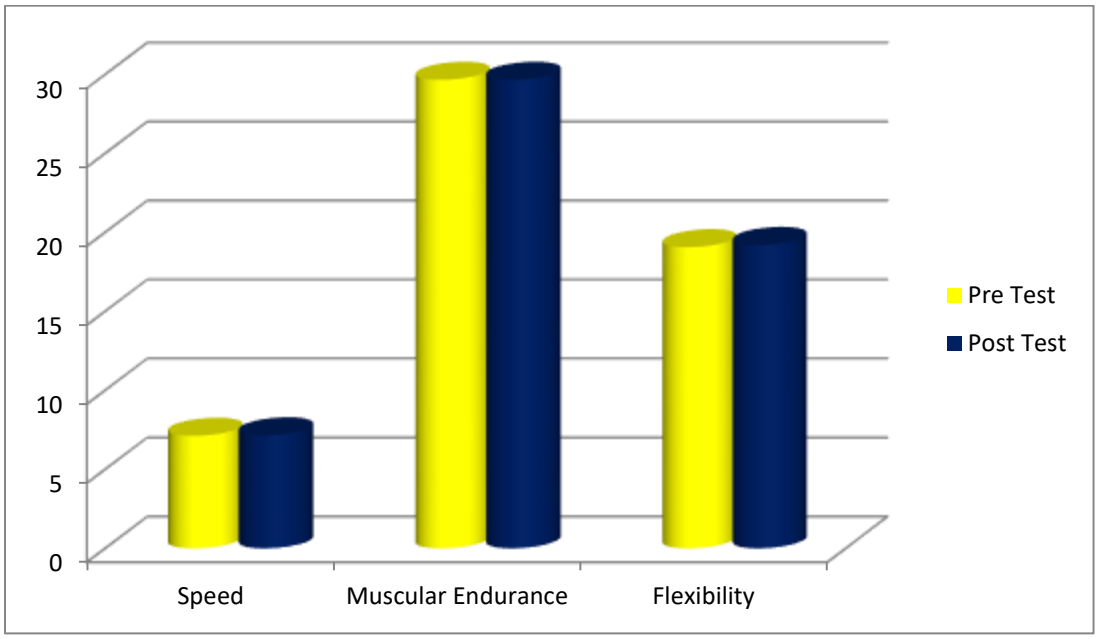
Variable	Test	Mean	Mean Difference	Std. Error of the mean	DF	't'	Table value
Physical Fitness Variables							
Speed	Pre test	7.12	0.03	0.096	14	2.02	
	Post test	7.15					
Muscular endurance	Pre test	29.66	0.00	1.06	14	1.87	**2.145**
	Post test	29.66					
Flexibility	Pre test	19.06	0.14	0.52	14	0.45	
	Post test	19.20					

** Significant at 0.05 level for the degrees of freedom 1 and 14, 2.145*

Table II suggests the obtained 't' values of the control group on criterion measure of 2.02 (speed), 1.87 (muscular endurance), 0.45 (flexibility). The obtained 't' values to be significant at 0.05 level for degree of freedom 1, 14 the required critical value was once 2.145. Hence the obtained 't' values on the selected criterion variables less than the required critical value, it was concluded that the control group no differences.

Figure 2:

Bar diagram showing the pre, post means values of control group (CG) on Speed, Muscular endurance and Flexibility.



Discussion:

The Swiss-ball training protocol used in this study aimed at providing the co activation of global and local muscles of the core. The results of the 12-week Swiss-ball training exercise protocol showed significant improvements in speed, strength endurance and flexibility of the upper back, lower back and abdominals. Based on the studies in the literature that suggest that exercises such as sit ups, double leg lowering, and push-ups performed on a Swiss-ball increase the level of muscular activity of the abdominals and obliques more than curl-ups, double leg lowering, and push-up performed on a stable surface (Vera Garcia et al., 2000), these findings seem congruent. Despite the used in these studies merely assessed the activity of the superficial

global muscle groups, the authors suggested that the motor control system required the activation of the global and local muscles to stabilize the spine to maintain balance and prevent the threat of falling off the Swiss ball.

Conclusion:

Swiss ball training has significant effect on physical fitness parameters such as speed, muscular endurance and flexibility. It means that swiss ball training increase speed and muscular endurance also increase flexibility therefore increase the swiss ball training to given the tennis players.

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