

# Effects of Plyometric Exercise and Circuit Training on Physical Fitness Selected Variably of Tennis Players

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## ARTICLE DETAILS

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## ABSTRACT

The purpose of the present study was to find out the Effects of Plyometric and Circuit Training on Physical Fitness Selected Variably of Tennis Players. For this study 45 Boys students studying at School Game Tennis Players Jaipur Rajasthan, of the age group 13 to 16 years were selected for the study. 45 students equally divided into three groups i.e. 15 students in Plyometric Exercise Group A, 15 students in Circuit Training Group B and 15 students in Control Group. By means of the training in Plyometric Exercise and Circuit Training s in Plyometric Exercise Group A, Circuit Training Group B, the information of aspects like Vertical Jump and Step-Ups of the subjects was checked by their test. It was hypothesis that that there will be significant difference between Plyometric Exercise Group, Circuit Training And Control Group on Explosive Strength and Stomach Abdominal Endurance. Statistical analysis was done of the raw scores and Mean, Mean Difference and Standard Deviation was found using "T" test and analysis of variance was set at 0.05% level of confidence, which is considered adequate for the purpose of the study.

## 1. Introduction

Physical fitness is the most precocious gift for the human beings. It cannot be purchased but obtain through daily appropriate physical exercises. The individual basic requirement for daily life is physical fitness. It is familiar to all that the efficient citizens are the asset of the nation and on the contrary weak citizens represent the burden on the nation. Thus, it is the duty of each nation to protect the physical fitness of each citizen. The individual basic requirement for daily life is physical fitness.

Fitness is the ability to cope mentally, socially and physically with everyday events in the environment. It is the ability to meet the demands of the environment and there are two types: physical and motor. Physical fitness is the ability of your body to cope with the demands of everyday life, and there are several components of physical fitness: cardiovascular endurance, muscular endurance, strength, flexibility, speed, and body composition. To be good at your sport, you need good physical fitness. Skill in our sport also depends on some of these aspects (i.e. motor): agility, balance, power, coordination, reaction time and speed.

Within the training and sports community there has been a gradual recognition of the critical importance of the rapid application of leg power. In the past the simple measures of speed for some sports and strength for others often left coaches and athletes scratching their heads at the outcomes of actual sporting events. Recruiting efforts that relied too heavily on these systems often did not yield the desired results.

Plyometrics comes from the Greek word "plethyein" (to augment or increase). The practice of plyometrics as a training method originated in the former Soviet Union in the 1970's, and was developed by Dr. Yuri Verkhoshansky, known as the "father of plyometrics". However, the good doctor didn't refer to

it as such, instead calling it the 'shock method'. During the 1970's Soviet Bloc countries dominated the Olympics and other athletic competitions, thanks in large part to Dr. Verkhoshansky's exercises. This grabbed the attention of an American track and field coach named Fred Wilt, who decided to investigate how the Soviets were training. After observing their methods, Wilt returned to the US, and in 1975 he coined the term 'plyometrics' and immediately began implementing the training method with his athletes. Since then, sports teams across the U.S. and the world have incorporated plyometrics into their training regimens to help their athletes become faster and more explosive.

"Plyometrics, or plyo, training is a method which combines strength and speed to produce power," says Algeri. "Plyometric exercises involve a lengthening or eccentric contraction of the muscles, immediately followed by shortening or concentric contraction of the same muscles – hence the jumping.

Research supports the idea that explosive (speed and strength) exercise builds athletic power, but is more effective when combined with other types of training.

For example, in a study conducted on recreational endurance runners, researchers showed that mixed maximal and explosive strength training was more effective than traditional approaches (such as circuit training) in increasing overall fitness and adaptive processes that may be helpful when increasing training loads (such as when a runner is training for a marathon).

Other published reports suggest that in order to maximize strength, power, and speed of movement, a combination of heavy and light explosive exercise provides superior results when compared to either training style alone.

Further evidence suggests that in order to maximize power output or speed of movement, the first phase of training should focus on increasing maximum strength and building a strong foundation. The second phase is devoted to power and speed training.

While strength training mostly creates nervous and muscular adaptations to make you stronger, plyometric exercises will help improve explosiveness, which is our ability to generate more force in less time,” says Algeri. “Plyo training, while improving the obvious elements like speed and power, also improves co-ordination and agility, making it one the best forms of training for any competitive sport where you’d need to change directions quickly, jump higher or be faster out of the starting blocks.

The benefits of abdominal strength and endurance are similar to strength and endurance in other skeletal muscles. Greater abdominal strength increases the amount of force that your abdominal contractions can generate against resistance. Flexing your abs repetitively or sustaining abdominal contractions for longer periods of time requires greater abdominal endurance. The unique benefits of abdominal strength and endurance derive from the function of this muscle group.

Step up exercise is a form of aerobic exercise. It stated gaining popularity among the fitness conscious people in the early 1980s. Step up workouts are easy to perform, can be performed anywhere and are observed to cause a number of beneficial effects on human health and appearance. These are

the reason that makes it recommendable by health and fitness experts to the beginners of exercising.

**2. Method**

For this study 45 Boys students studying at School Game Tennis Players Jaipur Rajasthan, of the age group 13 to 16 years were selected for the study. 45 students equally divided into three groups i.e. 15 students in Plyometric Exercise Group A, 15 students in Circuit Training Group B and 15 students in Control Group. By means of the training in Plyometric Exercise and Circuit Training in Plyometric Exercise Group A, Circuit Training Group B, the information of aspects like Vertical Jump and Step-Ups of the subjects was checked by their test.

It was hypothesis that that there will be significant difference between Plyometric Exercise & Circuit Training And Control Group on Leg Explosive Strength and Stomach Abdominal Endurance.

Statistical analysis was done of the raw scores and Mean, Mean Difference and Standard Deviation was found using “t” test and analysis of variance was set at 0.05% level of confidence, which is considered adequate for the purpose of the study.

**3. Result**

**Table-1**  
Showing the Difference of the Significance of the Means of Pre Test and Post Test of the Plyometric Exercise Group A, Circuit Training Group B and Control Group in the Performance of Vertical Jump

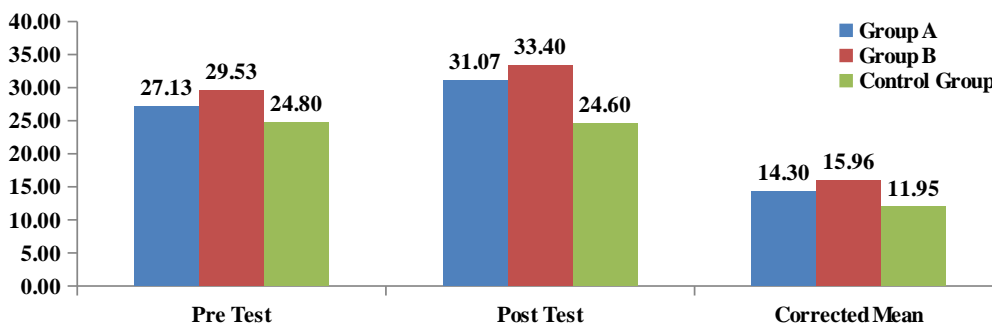
Group	Pre Test	Post Test	Mean Difference	T-Ratio
Plyometric Exercise Group A	27.13	31.07	3.93	10.77
Circuit Training Group B	29.53	33.40	3.87	10.59
Control Group	24.80	24.60	0.20	0.55

Level of Significance at 0.05 (44) = 1.68

In Vertical Jump Plyometric Exercise Group A Pre Test was 27.13 and Post Test mean was 31.07 mean difference was 3.93. Received “T” ratio was 10.77 which was found significant at 0.05 level. Circuit Training Group B Pre Test was 29.53 and Post Test mean was 33.40 mean differences was

3.87. Received “T” ratio was 10.59 which was significant at 0.05 level. While Control Group Pre Test was 24.80 and Post Test mean was 24.60 mean differences was 0.20. Received “T” ratio was 0.55 which found not was significant at 0.05 level.

**Graph-1**  
showing the comparison of the means of Pre Test and Post Test of the Plyometric Exercise Group A, Circuit Training Group B and Control Group in the Performance of Vertical Jump



**Table-2**

**Showing the Difference of the Significance of the Means of Pre Test and Post Test of the Plyometric Exercise Group A, Circuit Training Group B and Control Group in the Performance of Step-Ups**

Group	Pre Test	Post Test	Mean Difference	T-Ratio
Plyometric Exercise Group A	14.00	15.87	1.87	5.11
Circuit Training Group B	14.20	16.53	2.33	6.39
Control Group	12.27	12.00	0.27	0.73

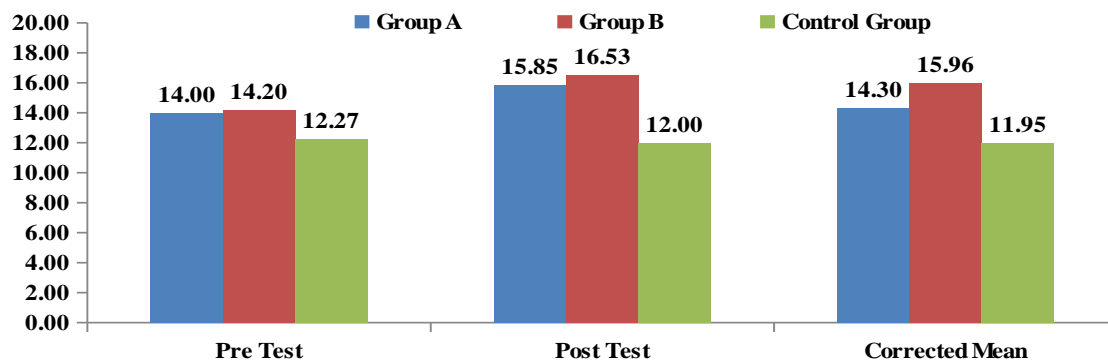
Level of Significance at 0.05 (44) = 1.68

In Vertical Jump Plyometric Exercise Group A Pre Test was 14.00 and Post Test mean was 15.87 mean difference was 1.87. Received "T" ratio was 5.11 which was found significant at 0.05 level. Circuit Training Group B Pre Test was 14.20 and Post Test mean was 16.53 mean differences was

2.33. Received "T" ratio was 6.39 which was significant at 0.05 level. While Control Group Pre Test was 12.27 and Post Test mean was 12.00 mean differences was 0.27. Received "T" ratio was 0.73 which found not was significant at 0.05 level.

Graph-2

showing the comparison of the means of Pre Test and Post Test of the Plyometric Exercise Plyometric Exercise Group A, Circuit Training Group B and Control Group in the Performance of Step-Ups



**4. Conclusion**

At the end of the study following conclusions were made.

1. At the end of the training program in Plyometric Exercise the Leg Explosive Strength of the Plyometric Exercise Group A and Circuit Training Group B subjects was seen increased.
2. At the end of the training program in Circuit Training the Stomach Abdominal Strength of the Plyometric

Exercise Group A and Circuit Training Group B subjects was seen increased.

3. In the subjects of the Controlled Group, no improvement was seen in the Pre-Test and Post-Test in the Abdominal Strength and Leg Explosive Strength.

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