

## Effect of plyometric training on selected physical fitness variables among college level volleyball players

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### Abstract

This study was designed to investigate the Effect of plyometric training on selected physical fitness variables among college level Volleyball players. To achieve the purpose of the study 30 inter-collegiate male Volleyball players were selected from TNPESU University, Chennai. The subjects was randomly assigned to two equal groups (n=15). Group- I underwent plyometric training (PTG) and Group - II was acted as control group (CG). The plyometric training was given to the experimental group for 3 days per week (Monday, Wednesday and Friday) for the period of twelve weeks. The control group was not given any sort of training except their routine work. A pilot study was conducted to assess the initial capacity of the subjects in order to fix the load. The physical parameters of speed (50 mts dash) and leg explosive power (vertical jump) before and after training period. The data collected from the subjects was statistically analyzed with 't' test to find out significant improvement if any at 0.05 level of confidence. The result of the speed and leg explosive power significant improvement due to influence of plyometric training with the limitations of (diet, climate, life style) status and previous training. The result of the present study coincide findings of the investigation done by different experts in the field of sports sciences. Plyometric training group significantly improved speed, leg explosive power of college level Volleyball players.

**Keywords:** plyometric training, speed, leg explosive power, volleyball players

### Introduction: Plyometric Training

Plyometric (also known as "ploys") is a type of exercise training designed to produce fast, powerful movements, and improve the functions of the nervous system, generally for the purpose of improving performance in sports. Plyometric movements, in which a muscle is loaded and then contracted in rapid sequence, use the strength, elasticity and innervations of muscle and surrounding tissues to 23 jump higher, run faster, throw further, or hit harder, depending on the desired training goal. Plyometric is used to increase the speed or force of muscular contractions, providing explosiveness for a variety of sport-specific activities. Plyometric has been shown across the literature to be beneficial to a variety of athletes. Benefits range from injury prevention, power development and sprint performance amongst others. Plyometric can improve strength in both your upper and lower body. Examples of lower body plyometric are tuck jumps, squat jumps, box jumps and depth jumps. The goal of these jumps is to get higher, utilizing your leg strength to improve the height of your jump.

### Volleyball

Volleyball is a dynamic, fast-paced game. The purpose of trength training for volleyball is not to build big muscles, but to develop the physical attributes necessary to improve a player's performance. So strength training is very important to volleyball and should not be developed independently of other abilities such as agility, quickness and endurance. When

watching a great volleyball player, the one word that comes to the mind is "quick". Everything the player does is short and quick. There are no long drawn out motions like sprinting in other sports. There is simply a succession of explosive bursts that keep the ball in play and control the flow of the game. The quickness that must be focused on, when training a volleyball player is not only quickness from side to side and front to back, but also quickness from up to down. Unique from other sports, volleyball players must be able to quickly change direction from the upward motion of a vertical jump to the downward motion of a point-saving dig (or vice versa). To play volleyball one has to be good at vertical jump, known as explosive power.

### Methodology

The purpose of the study was to find out the effect of plyometric training on selected physical fitness variables among college level volleyball players. To achieve the purpose of the study 30 inter-collegiate men volleyball players from TNPESU University, Chennai. The subjects were randomly assigned in to two equal groups namely, Plyometric training group (PTG) (n=15) and Control group (CG) (n=15). A pilot study was conducted to assess the initial capacity of the subjects in order to fix the load. The respective training was given to the experimental group the 3 days per weeks (alternate days) for the training period of twelve weeks. The control group was not given any sort of training except their routine.

**Table 1:** Computation of ‘T’ Ratio on Selected Plyometric training variables of college men volleyball players. Speed on Experimental Group and Control Group

| Variables | Group Name         | Mean |      | Sd   |      | Sd Error | Df | ‘t’ ratio |
|-----------|--------------------|------|------|------|------|----------|----|-----------|
|           |                    | Pre  | Post | Pre  | Post |          |    |           |
| Speed     | Experimental Group | 7.81 | 7.77 | 0.04 | 0.43 | 0.003    | 14 | 13.43*    |
|           | Control Group      | 7.81 | 7.82 | 0.41 | 0.43 | 0.02     |    | 0.48      |

\*level of significance was fixed at 0.05 with df 14 table value is 2.14

The table I shows that the mean values of pre-test and post-test of experimental group in speed were 7.81 and 7.77 respectively. The obtained ‘t’ ratio was 13.43 since the obtained ‘t’ ratio was greater than the required table value of 2.14 for significance at 0.05 level of with 14 degrees of freedom it was found statistically significant. The mean values of pre-test and post-test of control group in speed were 7.81

and 7.82 respectively. The obtained ‘t’ ratio was 0.48 which was lesser than the table value of 2.14 for significance at 0.05 level of with 14 degrees of freedom it was found statistically insignificant. The result of this study statistically proved that the experimental group showed significant improvement on speed due to plyometric training on college level volleyball players.

**Table 2:** Computation of ‘T’ Ratio on Selected Plyometric training variables of college men volleyball players. Leg Explosive Power on Experimental Group and Control Group

| Variables           | Group Name         | Mean  |       | Sd   |      | Sd Error | Df | ‘t’ ratio |
|---------------------|--------------------|-------|-------|------|------|----------|----|-----------|
|                     |                    | Pre   | Post  | Pre  | Post |          |    |           |
| Leg Explosive Power | Experimental Group | 28.60 | 33.93 | 2.16 | 2.68 | 0.62     | 14 | 8.46*     |
|                     | Control Group      | 26.73 | 27.60 | 3.01 | 3.06 | 0.80     |    | 1.07      |

\*level of significance was fixed at 0.05 with df 14 table value is 2.14

The table II shows that the mean values of pre-test and post-test of experimental group in leg explosive power were 28.60 and 33.93 respectively. The obtained ‘t’ ratio was 8.46 since the obtained ‘t’ ratio was greater than the required table value of 2.14 for significance at 0.05 level of with 14 degrees of freedom it was found statistically significant. The mean values of pre-test and post-test of control group in leg explosive power were 26.73 and 27.60 respectively. The obtained ‘t’ ratio was 1.07 which was lesser than the table value of 2.14 for significance at 0.05 level of with 14 degrees of freedom it was found statistically insignificant. The result of this study statistically proved that the experimental group showed significant improvement on leg explosive power due to plyometric training on college level volleyball players.

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**Conclusions**

1. It was concluded that twelve weeks Plyometric training significantly improved the speed, explosive power, of the inter collegiate male Volleyball players.
2. Plyometric training is one among the most appropriate means to bring about the desirable changes over physical variables of Volleyball players. Hence, suggested that coaches and the experts deal with Volleyball players to incorporate. Plyometric training as a component in their training programme.

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