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Effect of plyometric and resistance training on speed among collegiate level cricket players

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Abstract
The study aimed at to find out the effect of plyometric and resistance training on speed among collegiate level cricket players. The study was conducted in 24 participants who have been divided into two groups contained 12 members each. One group followed a plyometric training and the other with resistance training session. The training period lasted for 8 weeks and 24 sessions have successfully completed. The duration of the session was 45-75 minutes. Pre-test and post tests have conducted before and after the training period respectively. 40 meters run was the tool to measure speed. Paired t-test has been administered in resistance training group and plyometric training group to identify the difference between pre-training and post-training. Two sample t-test was the statistical tool used to find out the difference between plyometric training and resistance training effect. Result shows that both training methods could produce a significant change in speed performance (Table 1 and Table 2) but plyometric training method improved speed than resistance training method (Table 3). The level of significance kept at 0.05 level.

Keywords: Plyometric training, resistance training, speed, cricket players

Introduction
Sports training is a scientifically based approach of preparing players with the purpose of gaining and maintaining higher performance capability in a range of sports. It's a type of training that aims to improve fitness and performance in a particular sport. Sports training is based on scientific knowledge, is a pedagogical process of sports perfection through which systematic effect on psycho-physical performance ability and performance readiness aims at leading the sportsman to high and the highest performance, Defined by Harre. Sports coaches must be familiar with the numerous training methods available, as well as their benefits and drawbacks. Each sports training method is distinct and has its own set of benefits and drawbacks. Marathon runners benefit from particular types of training, such as continuous training, and sports coaches and athletes should be aware of these benefits and how to incorporate them as efficiently as possible into their training plans.

Speed is described in sports as the ability to accomplish any movement in the lowest time possible, such as a throw, sprint, or jump. As a result, your speed is closely linked to your strength, or your ability to generate the greatest amount of force in the shortest amount of time. Cricketers are not sprinters but both types of athletes need acceleration. The difference in the type of speed. Sprinters respond to a single sound, run in a straight line, and hit a ball in a single dash. It's unusual for a cricket player to accelerate more than 30 yards throughout a match. Fielding and hitting entail reacting to a variety of situations. Players must be able to execute in a variety of speed bursts. Also, for fast bowlers and batters, upper body acceleration is more vital since the faster your arms accelerate better the skill execution. Acceleration, on the other hand, is essential for both running speed and skill execution, such as bowling and playing shots. As a result, speed plays an important role in cricket, as the faster you run, the more singles you can steal or save on the field. Various research study reported that plyometric and resistance training, being an effective training method, have been included as part of an overall seasonal training program (Whitehead *et al*., 2018).

Plyometric training is a series of explosive body weight resistance exercises using the stretch-shortening cycle of the muscle fibre to enhance physical capacities. Concentric contractions (muscle shortening) are followed by eccentric contractions (muscle lengthening/stretching the muscles). This is a fantastic way to build muscles while also improving agility, stability, and balance. Your muscles will be able to perform more rapidly and efficiently as a result of these combined benefits. Resistance training is a modality of exercise that particularly for its role in improving athletic performance by increasing

muscular strength, power and speed (Kraemer & Ratamess, 2004). When we work against a moderate level of resistance, our muscles become stronger and more capable of producing large quantities of force, which makes us faster when the resistance is gone.

Plyometric and resistance training methods consider as adequate training types for the development of speed. They aid athletes in increasing their speed-to-strength ratio, allowing them to generate more force during sprint starts or other quick accelerations. The more force an athlete generates when pushing off from the ground, the faster they will propel themselves away from the ground. It's necessary for sprinting.

Methodology

The purpose of the study was to compare the effectiveness of plyometric and resistance training on speed among collegiate level cricket players. An experimental method has been used in this investigation. Collegiate level male cricket players from Kottayam district in Kerala were participated as subjects. Age category of subjects ranged between 20-25. Total number of subjects were 24 and divide them into plyometric and resistance group with 12 members each. 8 weeks training program has been completed among both groups as plyometric training group received plyometric training and resistance training group received resistance training. The training program carried out for three days in a week. A total number of 24 sessions successfully received by both groups. Total duration of a training session was 45-75 minutes. Speed performance test has administered before and after the training period respectively. 40 meters run was the tool to measure speed. Paired t-test was calculated in resistance training group and plyometric training group to identify the difference between before and after the training. Two sample t-test was the tool used to find out the difference between the effect of plyometric training and resistance training. The level of significance kept at 0.05 level.

Resistance training includes

- Squat
- Lunges
- Resistance band sprint
- Leg press
- Push ups

Plyometric training includes

- Jump and squat
- Box jump
- Double leg bounding
- Single leg hop
- Scissors jump

Intensity of the exercises were increased in every two weeks. Proper warming up and cooling down sessions were also included during training period.

Result

The result of the study given below,

Table 1: Statistical analysis of resistance training group Test: Paired t-test (one tail)

Average (mean)							
Before training	**After Training**	**Mean difference**	**Standard error**	**L.O.S**	**t statistic**	**d.f (n-1)**	**p. value**
6.865833	6.776667	0.08916667	0.01831783	5%	4.8678	11	0.0002482

L.O.S:- Level of Significance, d.f:- degrees of freedom

Since p value < 0.05, significant difference found between pre-training and post-training among resistance training group.

Table 2: Statistical analysis of plyometric training group Test: Paired t-test (one tail)

Average							
Before training	**After Training**	**Mean difference**	**Standard error**	**L.O.S**	**t statistic**	**d.f (n-1)**	**p. value**
6.868333	6.283333	0.585	0.07224223	5%	8.0978	11	0.0000029

L.O.S:- Level of Significance, d.f:- degrees of freedom

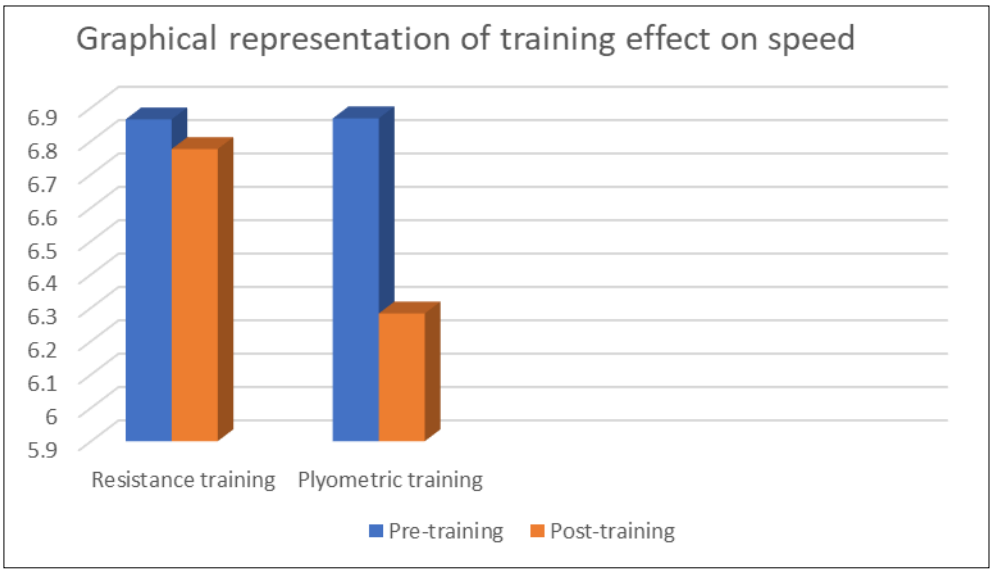
Since p value < 0.05, significant difference found between pre-training and post-training among plyometric training group.

Table 3: Comparative analysis between resistance training and plyometric training group Test: Two sample t- test (One tail)

Average							
Resistance training	**Plyometric Training**	**Mean difference**	**Standard error**	**L.O.S**	**t statistic**	**d.f (n-1)**	**p value**
6.776667	6.283333	0.493333	0.214298	5%	2.3021	20	0.01563

L.O.S: - Level of Significance, d.f: - degrees of freedom

There is a significant difference has been found between resistance training group and plyometric training group since the p value < 0.05. plyometric training improves the speed than resistance training.



Graph 1: Mean scores of pre-training and post-training of resistance training and plyometric training groups

Discussion on findings

In this study, the researcher has investigated to find out the difference between plyometric training and resistance training on speed in collegiate level cricket players. The result of the study shows that both training methods made a significant improvement on speed among subjects. Hence plyometric training was more effective when compared to resistance training result (Table 3).

Conclusion

Based on result of the study, the following conclusions were drawn.

- Significant difference found between before and after the training period in resistance training group. Resistance training improved speed (Table. 1).
- Significant difference found between before and after the training period in plyometric training group. Plyometric training improved speed (Table. 2).
- Significant difference has been discovered between plyometric and resistance training group. Plyometric training method improves the speed than resistance training method in collegiate level cricket players (Table. 3).

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