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Effectiveness of plyometric training on sprint performance in college level athletes

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Abstract
Introduction: Speed represents the ability of an individual to perform motor actions in minimum time and with maximum efficiency, so its development and training is essential, since in most of the sport-physical activities, actions related with speed are needed.
Aim: Aim of the study is to find out the effectiveness of Plyometric training on sprint performance in college level athletes.
Method: Pre and Post Experimental study was conducted to find the effectiveness of Plyometric training on sprint performance in college level athletes. By purposive sampling method 10 subject ages between 17-21yrs (College Students -Athelets) and only males were selected. Duration of the study was 2 months
Data collection: By using
Speed: 50 meter sprint run
Acceleration: 10 meter splint run with push-ups.
Training program: Included Plyometric training for 30 min, five sessions per week over a period of 4 weeks. Patients were assessed at the baseline using speed and acceleration, and reassessed after 4 weeks.
Result: Plyometric training shows significant difference in the pre and post test values, before and after application of Plyometric training. The mean score of Speed- pre assessment 8.8 and post assessment 6.6, the mean score of Acceleration pre assessment 5 and post assessment 3.9.
Conclusion: The finding of the study revealed that Plyometric training is effective on sprint performance for collage level athletes.

Keywords: plyometric training, speed, acceleration, sprint performance

Introduction
Speed represents the ability of an individual to perform motor actions in minimum time and with maximum efficiency {Martin Acero, 2OO6}, so its development and training is essential, since in most of the sport-physical activities, actions related with speed are needed.
In much of the literature on velocity you can see how they support the theory that the rate appears to have a strong hereditary or innate component, not to mention having other factors to b improved with training, and more with strength training, as speed itself is the rapid application of force. Lopez, M., {1995} identifies four factors of speed: hereditary, sensory, cognitive, neural factors and muscle tendons. This idea can be completed with the contribution of different authors who dare say that speed has two main components, the nerves, which are mostly hereditary and are responsible for transmission of nerve impulses and muscular, which depend on the speed of its contractions In speed training, the development of certain factors such as specific strength, technique and speed are crucial for the obtainment of performance. We can summarize the methods and means necessary for speed training and specific force in:

a. Development of speed
- Progressive training. “Ins and outs.”
- Assisted training.

b. Development of specific strength
- Auto loads.
- Muscle training.
- Weathered training

- Plyometrics {SJ, CMJ, DJ}.
- Multi jumps.

c. Development of the technique

- Race technique {Amplitude and frequency of stride}

Methods and means necessary for the development of specific speed and strength. {From, Donati 1996; Heisler *et al*. 1989; Korchemny and Hokinson 1993; Mero *et al*. 1992}. In recent years, plyometric has been introduced as a method for improving the strength and speed.

Plyometric Training

The term plyometric is a combination of Greek root, that means to increase measurement-plio-means"more"and metric means "to measure".

Plyometrics, also known as jump training or plyos, are exercises in which muscles exert maximum force in short intervals of time, with the goal of increasing power {speed-strength}. This training focuses on learning to move from a muscle extension to a contraction in a rapid or 'explosive' manner, such as in specialized repeated jumping. Plyometrics are primarily used by athletes, especially martial artists, sprinters and high jumpers, to improve performance, and are used in the fitness field to a much lesser degree.

Benefits of the technique

Plyometrics training are improves the power output of sports people who utilize this training method. Plyometric training said to improve:

1. Greater recruitment of muscle fibers
2. Explosive muscle power
3. Eccentric strength
4. Endurance
5. Co-ordination
6. Decreased injury
7. Jumping abilities.

Aim and Objectives

Aim

Aim of the study is to find out the effectiveness of Plyometric training on sprint performance in college level athletes.

Objectives

To find out the effectiveness of plyometric training program in improving speed on sprint performance in college level athletes.

To find out the effectiveness of plyometric training program in improving acceleration on sprint performance in college athletes.

Need of the study

From a sports point of view, speed represents the ability of an individual to perform motor actions in minimum time and with maximum efficiency, so its development and training is essential, since in most of the sport-physical activities, actions related with speed are needed. Plyometric training increases not only with the lower body but also with the upper body improvement and thus achieves higher performance depending on the sports.

Materials

Stop watch
Marker
Cones
Measuring tape
Paper
Pen

Methodology

Study Design: The study was a Pre and Post Experimental study

Study Setting: The study is conducted at, Thanthai Roever Institution, Roever campus, Perambular.

Sampling Method: Purposive Sampling

Sample Size

Total numbers of 10 students were taken. All the subjects were selected through purposive sampling method. All the outcome measures were recorded by a therapist prior to the intervention (baseline measures) and post intervention (i.e., after 4 weeks).

Study Duration: The study is conducted for a period of 2 months.

Inclusion Criteria

- Only males
- Age limit [17 to 21]
- College students[Athletes]

Exclusion Criteria

- Females
- Age Below 17 & Above 21
- Recent injuries and fracture

Measuring Tools

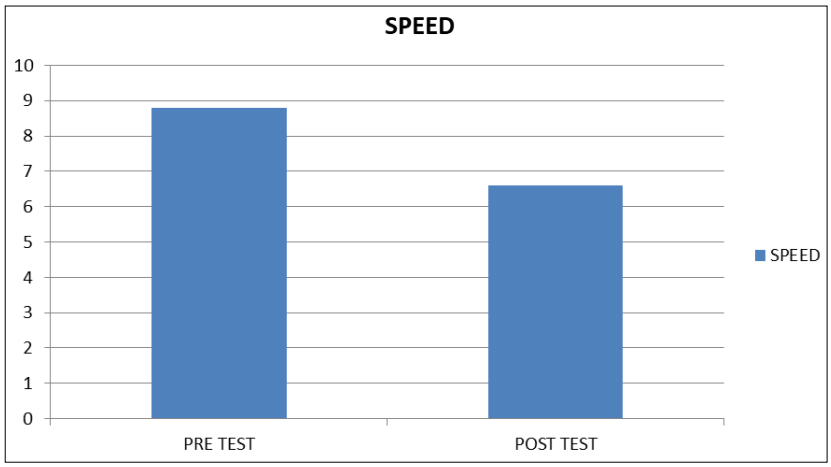
Speed : 50 meter sprint run
Acceleration : 10 meter splint run with push-ups.

Structured Plyometric Training
Jump squat exercises
Jumping lunge exercises
Side hops or lateral side jump exercises
Jumping jack exercises
Skater jump exercises
Broad jump exercises
High knees exercise
Butt kicks exercise

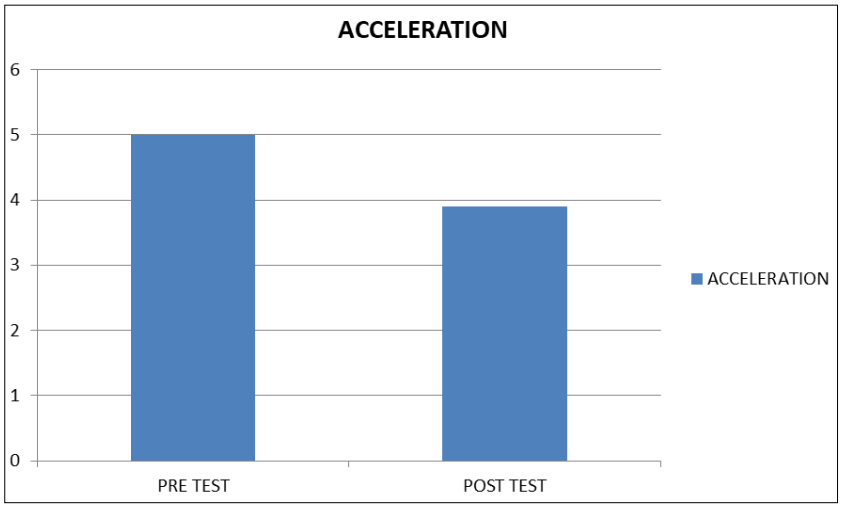
Data Analysis

Table 1: Represents Speed and Acceleration

S. No.	Speed [50 MTS]		Acceleration [10 MTS with Push UPS]	
	Pretraining [SEC]	Post Training [SEC]	Pre Training [SEC]	Post Training [SEC]
1	9	6	5	3
2	10	7	6	5
3	8	6	4	3
4	9	7	5	4
5	10	8	6	5
6	7	5	4	3
7	8	6	5	4
8	10	8	6	5
9	9	7	4	3
10	8	6	5	4
Mean	8.8	6.6	5	3.9



Graph 1: {SPEED}: 50 Meters running



Graph 2: {ACCLERATION}: 10 Meters Running with Push Ups

Result

Result shows that the plyometric training exercise was effective to improve speed, acceleration in collage level athletes.

Plyometric training shows significant difference in the pre test and post test values, before and after application of Plyometric training. The mean score of Speed- pre assessment 8.8 and post assessment 6.6. The mean score of Acceleration pre assessment 5 and post assessment 3.9. As speed and acceleration increase time taken to complete task reduces.

Discussion

The result obtained before and after the training period in the 50m sprint run indicate that there is a significant improvements in the training group exists after period of 4 weeks, which may be due to the effect of increasing the plyometric explosive strength and potency of the athletes. With this data we can suggest that 4 weeks training sessions can get benefits, which can be observed, in improving acceleration and speed. [Pre and post test values]

Conclusion

The study concluded that plyometric training is effective on sprint performance for collage level athletes.

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