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An Impact of Plyometric Training Packages with and Without Resistance Training on Leg Explosive Power of Arts College Men Basketball Players

KEYWORDS: Explosive Power, Plyometric, Resistance Training

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ABSTRACT *The purpose of this study was to find out the impact of Plyometric Training Packages with and without resistance training on leg explosive power of Arts College men Basketball players. The study was conducted on thirty men(N=30) basketball players studying at various Arts College affiliated to Bharthidasan University, Tiruchirappalli, Tamil Nadu, India, were selected randomly as subjects. Subjects were classified into three groups, namely Plyometric training with Resistance (n = 10) Plyometric training without Resistance (n = 10) and Group III (n=10). The experimental groups underwent respective training for 10 weeks duration Leg explosive power were selected as dependent variable. Leg explosive power was assessed by standing broad jump test. To make adjustments for difference in the initial means and test the adjusted post test means for significant differences, the analysis of covariance (ANCOVA) was used. Since three groups were involved whenever the 'F' ratio was found to be significant for adjusted post means, Scheffe's test was followed as a post hoc test to determine which of the paired means difference was significant. The results of the study suggested plyometrtic training with Resistance showed significant difference among the groups.*

INTRODUCTION

Plyometric training can take many forms, including jump training for the lower extremities and medicine ball exercises for the upper extremities. Jump training exercises were classified according to the relative demands they placed on the athlete. All the exercises are progressive in nature, with a range of low to high intensity in each type of exercise. The classification of exercises is jumps in place; standing jumps; multiple hops and jumps, bounding, box drills and depth jumps.

Basketball is an athletic sport, usually played on an indoor court in which two competing teams of five players each attempt to score by throwing an inflated ball so that it descends through one of two baskets suspended, at each end of the court, above their heads. The team scoring the most such throws, through field goals or foul shots, wins the game. Because of its continuous action and frequent scoring, basketball is one of the most popular spectator as well as participant sports in the world.

Speed is the product of two factors: stride length and stride frequency. Increasing either factor automatically increases a runner's sprinting speed. From the training point of view, it appears that increasing the leg strength can increase the stride length. Though stride frequency is an inborn quality, it might be possible to improve it slightly through training. It appears that this improvement also brings about a corresponding shortening of stride length. In stride frequency time becomes our concern. When we reduce the time necessary to apply force at take off and eliminate wasted time in the air, the stride frequency will improve (Eicher, 1975).

Strength is the neuromuscular capability to overcome an external and internal resistance. The maximum strength that an athlete can produce depends on the biomechanical characteristics of a movement, and the magnitude of contraction of the muscles involved. In addition, the maximum strength is also a function of the intensity of an impulse (Bompa, 1999).

METHODOLOGY

To achieve the purpose of the study, thirty(N=30) men Basketball players studying at various Arts College affiliated to Bharathidasan University, Tiruchirappalli, Tamilnadu, India, were selected at random as subjects of this study. The age of the subjects were ranged from 18 to 22 years. The subjects were assigned equally into three groups namely Group –I underwent Plyometric training with Resistance (n = 10) Group –II underwent Plyometric training without Resistance (n = 10) and Group III (n=10) acted as control group of 10 each. All the three groups underwent their respective training for 10 weeks. Leg Explosive power was selected as dependent variables and it was assessed by standing broad jump test. All the groups were tested on selected criterion variables prior to and immediately after the training periods. To make adjustments for difference in the initial means and test the adjusted post test means for significant differences, the analysis of covariance (ANCOVA) was used. Since three groups were involved whenever the 'F' ratio was found to be significant for adjusted post means, Scheffe's test was followed as a post hoc test to determine which of the paired means difference was significant. The level of significance was fixed at 0 .05 level of confidence for all the cases.

RESULTS AND DISCUSSION

The Analysis of covariance (ANCOVA) on Leg Explosive power of plyometric training packages with and without resistance training groups and the Control Group have been analysed and presented in Table -I.

TABLE – I ANALYSIS OF COVARIANCE ON LEG EXPLOSIVE POWER OF PLYOMETRIC TRAINING PACKAGES WITH AND WITHOUT RESISTANCE TRAINING GROUPS AND THE CONTROL GROUP

Certain Variables	Adjusted Post test Means			Source of Variance	Sum of Squares	df	Mean Squares	'F' Ratio
	Plyometric Training with Resistance Training group-(I)	Plyometric Training without Resistance Training group-(II)	Control Group (III)					
Explosive Power	2.25	2.18	2.11	Between0 With in	0.11 0.01	2 26	0.05 0.0003	166.67*

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***Significant at .05 level of confidence.**
(The table value required for significance at 0 .05 level with df 2 and 26 is 3.37)

Table 1 shows that the adjusted post test mean value of Leg Explosive power for Plyometric Training with resistance training group, Plyometric Training without resistance training group and Control Group are 2.25, 2.18 and 2.11 respectively. The obtained F-ratio was 166.67 for the adjusted post test mean is more than the table value 3.37 for df 2 and 26 required for significance at 0.05 level of confidence.

The results of the study indicate that there is a significant difference among the adjusted post test means of experimental groups and control group on the increase of Leg Explosive power.

To determine which of the paired means had a significant differences, Scheffe's test was applied as Post hoc test and the results are presented in Table II.

Table - II THE SCHEFFE'S TEST FOR THE DIFFERENCES BETWEEN THE ADJUSTED POST TESTS PAIRED MEANS ON LEG EXPLOSIVE POWER

Certain Variables	Adjusted Post test Means			Mean Difference	Confidence Interval
	Plyometric Training with Resistance Training group-(I)	Plyometric Training without Resistance Training group-(II)	Control Group (III)		
Explosive Power	2.25	2.18		0.07*	0.0001
	2.25		2.11	0.14*	0.0001
		2.18	2.11	0.07*	0.0001

*** Significant at 0.05 level of confidence**

Table II shows that the adjusted post test mean for differences on Leg Explosive Power between Plyometric Training with resistance training group and Plyometric Training without resistance training group, Plyometric Training with resistance training group and Control group and Plyometric Training without resistance training group and Control group were 0.07, 0.14 and 0.07. The values are greater than the confidence interval 0.0001, which shows significant differences at 0.05 level of confidence.

The adjusted post test means values of Plyometric Training with and without resistance training group and control groups on Leg Explosive Power were graphically represented in the figure I.

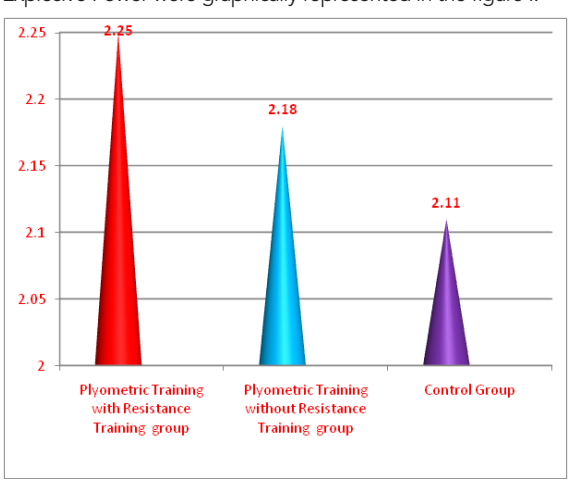

FIGURE I: ADJUSTED POST TEST MEAN VALUES OF Plyometric Training with and without resistance training group and control groups on LEG EXPLOSIVE POWER

CONCLUSION

From the analysis of the data, the following conclusions were drawn.

1. The Experimental group had registered significant improvement on the selected criterion variable namely Leg Explosive Power.
2. It may be concluded that the Plyometric Training with resistance training group is better than Plyometric Training without resistance training group and Control Group in improving Leg Explosive Power.

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