



ISSN: 2456-0057

IJPNPE 2018; 3(2): 944-946

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www.journalofsports.com

Received: 24-05-2018

Accepted: 27-06-2018

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## Effect of plyometric ballistic training and basketball drills on leg explosive power among school level basketball players

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### Abstract

The purpose of the Study was to find out the effect of plyometric ballistic training and basketball drills on leg explosive power among school level basketball players. To achieve the purpose of the study, sixty (n=60) School level basketball players from CMC school, Vellor, they were selected as subjects at random and their age's ranged between 16 to 18 years. The selected participants were randomly (simple random sample) assigned to one of four groups of fifteen (n=15) each, such as experimental group I, experimental group II, experimental group III and control group. The group I (n=15) underwent plyometric training, and group II (n=15) underwent ballistic training, group III (n=15) underwent Basketball drill for a duration of 12 weeks and the number of sessions per week is confined to three days, in addition to the regular schedule and group IV (n=15) acted as control. Leg explosive power was selected as dependent variables for this study. The following independent variables were selected for this study such as plyometric training, ballistic training, and Basketball drill. The pre-test and post-test randomized control group design was used as experimental design. The collected data from the four groups prior to and immediately after the training programme on selected criterion variables were statistically analyzed with analysis of co-variance (ANCOVA) was used to find out the significant difference between experimental and control groups. Whenever the 'F' ratio for adjusted test was found to be significant, the Scheffe's test was applied as post-hoc test to find out paired mean difference. In all the cases 0.05 level of significant was fixed to test the hypothesis. The plyometric training, ballistic training, Basketball drill training had significantly improved the participants leg explosive power. The plyometric training had significantly outperformed than ballistic training, Basketball drill training on the participant's leg explosive power.

**Keywords:** Plyometric training, ballistic training, basketball drill training

### 1. Introduction

Sports' training is done for improving sports performance. The sports performance, as any other type of human performance, is not the product of on single system or aspect of human personality. On the contrary, it is the product of the total personality of the sports person. The personality of a person has several dimensions e.g., physical, physiological, social and psychic. In order to improve sports performance the social and psychic capacities of the sports person also have to be improved in addition to the physical and physiological ones. In other words the total personality of a sportsman has to be improved in order to improve his performance. Sports' training, therefore, directly and indirectly aims at improving the personality of the sportsman. No wonder, therefore, sports training is an educational (i.e., pedagogical) process.

"Sports training is a planned and controlled process in which, for achieving a goal, changes in complex sports motor performance, ability to act and behavior are made through measures of content, methods and organisation". [Martin, 1979].

### 2. Purpose of the Study

The purpose of the Study was to find out the effect of plyometric ballistic training and basketball drills on leg explosive power among school level basketball players.

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**3. Methodology**

To achieve the purpose of the study sixty (n=60) School level basketball players from CMC school, vellor, they were selected as subjects at random and their age's ranged between 16 to 18 years. The selected participants were randomly (simple random sample) assigned to one of four groups of fifteen (n=15) each, such as experimental group I, experimental group II, experimental group III and control group. The group I (n=15) underwent plyometric training, and group II (n=15) underwent ballistic training, group III (n=15) underwent Basketball drill for a duration of 12 weeks and the number of sessions per week is confined to three days, in addition to the regular schedule and group IV (n=15) acted as control. Leg explosive power was selected as dependent variables for this study. The following independent variables were selected for this study such as plyometric training, ballistic training, and Basketball drill. The pre-test and post-test randomized control group design was used as experimental design. The collected data from the four groups prior to and immediately after the training programme on selected criterion variables were statistically analyzed with analysis of co-variance (ANCOVA) was used to find out the significant difference between experimental and control groups. Whenever the 'F' ratio for adjusted test was found to be significant, the Scheffe's test was applied as post-hoc test to find out paired mean difference. In all the cases 0.05 level

of significant was fixed to test the hypothesis.

**4. Training Programme**

**4.1 Plyometric Training**

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.

**4.2 Ballistic Training**

Ballistic training, also called power training, is a form of strength training in which an athlete lifts, accelerates, and then releases the weight, rather than slowly lowering it as in other forms of weight training, Ballistic training is commonly used by athletes to develop explosiveness and power.

**4.3 Basketball Ball drill**

Regardless of the style of basketball your team plays, all players need to be able to handle the ball. The best way for a player to gain confidence in ball handling is through hours of practice. When doing ball-handling drills

**5. Analysis of data**

**Table 1:** The Results of Analysis of Covariance on Leg explosive power of Different Groups

Test		G- 1	G- 2	G-3	G-4	SV	SS	Df	Mean squares	'F' Ratio
Pre test	Mean	1.6090	1.6325	1.6685	1.6675	B	.036	3	0.018	4.478
	S.D.	.05251	.05646	.07802	.06812	W	.229	56	0.004	
Post test	Mean	1.7450	1.7765	1.8080	1.7581	B	.040	3	0.020	8.122
	S.D.	.02236	.04283	.07068	.05668	W	.139	56	0.002	
Adjusted post test	Mean	1.757	1.778	1.794	1.784	B	.011	3	0.006	3.462*
						W	.093	57	0.002	

\* Significant at .05 level of confidence.

(The table values required for significance at .05 level of confidence for 3 and 56 and 3 and 57 are 3.16). B-Between, W-Within, SS-Sum of Square, Df-Degrees of Freedom, MS-Means Square

**5.1 Results of Leg explosive power**

The pre test mean and standard deviation on leg explosive power of G1, G2, G3, and G4 were 1.6090, 1.6325, 1.6685 and 1.6675 respectively, the obtained pre test F value of 4.478 was lesser than the required table F value of 3.16. Hence the pre test mean value plyometric training, ballistic training, Basketball drill and control group on leg explosive power before start of the respective treatments were found to be insignificant at 0.05 level of confidence for the degrees of freedom 3 and 56. Thus this analysis confirmed that the random assignment of subjects into four groups were successful.

The post test mean and standard deviation on leg explosive power scores of G1, G2, G3, and G4 were 1.7450, 1.7765, 1.8080 and 1.7581 respectively. The obtained post test F value of 8.122 was greater than the required table F value of 3.16. Hence the post – test mean value of leg explosive power, showed significant at 0.05 level of confidence for the degrees of freedom 3 and 56. Thus the result obtained proved that the interventions namely plyometric training, ballistic training, Basketball drill on leg explosive power produced significantly different improvements between the training groups.

The adjusted post test mean on leg explosive power scores of G1, G2, G3, and G4 were 1.757, 1.778, 1.794 and 1.784 respectively. The obtained adjusted post-test F value 3.462 was greater than the required table F value of 3.16. Hence the post test mean value of leg explosive power, showed significant at 0.05 level of confidence for the degrees of freedom 3 and 56.

The end results of analysis of covariance prove that there was significant difference on the selected three trainings and control group on leg explosive power. In order to find out which intervention programme used in the present study was the source for the significance of adjusted mean was tested by Scheffe's post hoc test.

**Table 2:** The Results of Scheffe's Post Hoc Test Mean Differences on Leg explosive power Among Four Groups

PT	BT	BBDT	C.G	Mean Differences	Confidence Interval Value
1.757	1.778			0.21*	0.04
	1.778		1.784	0.06*	0.04
1.757			1.784	0.27*	0.04
	1.778	1.794		0.16*	0.04

\* Significant at .05 level of confidence.

**5.2 Results of Post-hoc test on leg explosive power**

The table II show that the pair wise comparisons of between the groups on leg explosive power. The paired mean differences of group 1 and 2, group 1 and 3, group 2 and 3

group 2 and 3 were 0.21, 0.06, 0.27, and 0.16 greater than the confidential interval value of 0.04.

Hence all three comparisons show the significant. The overall observations of the pair wise comparisons indicate that, the selected three training proved better performance on leg explosive power compare with control group. Further, between the three trainings the plyometric training confirms that best in leg explosive power performance, rather than other trainings.

## 6. Conclusions

The following conclusions were derived from the present Study

The plyometric training, ballistic training, Basketball ball drill training had significantly improved the participants leg explosive power. The plyometric training had significantly outperformed than ballistic training, Basketball drill training on the participant's leg explosive power.

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