

# **Influence of Plyometric Training on Fitness and Performance of Indian Junior National Soccer Players**

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**Abstract:** *the main aim of this study is to identify the influence of plyometric training on fitness and soccer playing abilities of Junior National level male football players ranging between 17-19 years of age and origin of Khammam, Telangana, India. The selected variables for this study were fitness variables: Speed, Leg strength, Leg explosive strength and cardio respiratory efficiency and soccer Performance Variables: Kicking and Shooting. These variables were tested before and after 12 weeks of plyometric training. There was a significant difference in mean between pre test and post test results on fitness and soccer performance abilities among experimental subjects, the significance was .000 in all variables at  $p < 0.05$  level however significant difference not found in control group.*

**Keywords:** *Plyometric, speed, explosive strength, cardio respiratory, kicking, shooting.*

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## **I. Introduction:**

Football was transformed from a dying folk ritual in the British countryside to the world's most popular and commercialized sport in just a century. It was nurtured in England's elite universities and public schools before bursting out into the cities of Victorian Britain. Along the way the game acquired pitch markings, 11 players per side, and forbade the use of hands.

Using Plyometrics in Football Training we do not need to schedule specific workouts emphasizing plyometric training. For football players, plyometric drills can be incorporated after the warm-up and preceding the main body of training. These drills should emphasize a full and smooth range of motion more than eccentric overload and use the pre-stretch of the muscle to facilitate rapid movement, mechanical efficiency and coordination. As with other types of training, plyometric exercises are performed in intervals over the course of the season. Volume and intensity will vary over the course of the season. In general, the volume of plyometric exercises for football players will be low to moderate. The intensity also will be low to moderate.

Ying-Chun Wang, Na Zhang (2016) experimented on plyometric training which is used to increase strength and explosiveness. It consists of physical exercises in which muscles exert maximum force at short intervals to increase dynamic performances. There is consensus on the fact that when used, PT contributes to improvement in physical qualities which was primarily used by athletes in all types of sports. However, although PT has been shown to increase performance variables in many sports, little scientific information is currently available to determine whether PT actually enhances skill performance in soccer players, considering that soccer is an extremely demanding sport. Soccer players require dynamic muscular performance for fighting at all levels of training status, including rapid movements such as acceleration and deceleration of the body, change of direction, vertical and horizontal jumps, endurance, speed as well as power for kicking and tackling.

Based on above review, this research study experimented with plyometric training on performance of Indian junior soccer players

## **II. Methodology**

### **Selection of Subjects:**

The present study was conducted on forty (40) Junior National level male football players ranging between 17-19 years of age. The subjects were randomly selected and training was conducted at Government Degree College, Khammam District, Telangana, India. The subjects were divided into two groups namely: First group was Plyometric Training i.e. Experimental Group (N=20) and second one was Control Group (N=20).

**Table No.1 Physical characteristics results between Experimental and Control groups**

Sl.No	Name of the group	Age(Yr)	Height(cm)	Weight(kg)	BMI	T.A(Yr)
1	Plyometric Group	18	172.6	58.75	19.79	6.2
2	Control Group	18	174.2	59.4	19.54	6.4

**Selection of Variables:**

The research scholar experimented on fitness and performance variables of soccer. The Administrating feasibility in terms of availability of instruments, time factor from point of view of subjects were considered for the collection of data. The following variables were selected. **The fitness variables:** Speed, Leg strength, Leg explosive strength and cardio respiratory efficiency. **The Performance Variables:** Kicking and Shooting

**Research Design:**

The experimental group were administered 12weeks duration with different types of plyometric exercise program for the development of fitness level and performance of Junior National football players. A proper warming-up period of 10 minutes duration was given before training sessions (3 days per week). The control group was not allowed to participate in any of the training programme except their daily routine practice. Measurements of fitness variables and football performance variables were taken before and after with the informed consent of all subjects. The training load was increased in a progressive manner, after every two weeks. The fitness data was collected by administering 50mts Run test for speed, 1 RM half squat test for leg strength, Standing broad jump for leg explosive strength and Cooper 12Minuetes run/walk test for cardio respiratory efficiency. The data of playing abilities in soccer was collected by AAHPER test for kicking ability and MOR S. CHRISTIAN test for shooting.

**Statistical Technique:**

After the data collected, they should be processed and critically analyzed to draw exact conclusions. In the present study, the collected data were analyzed using t ratio to find the mean differences and ANOVA was used to test the variance between groups. The significance was set at 0.05 levels.

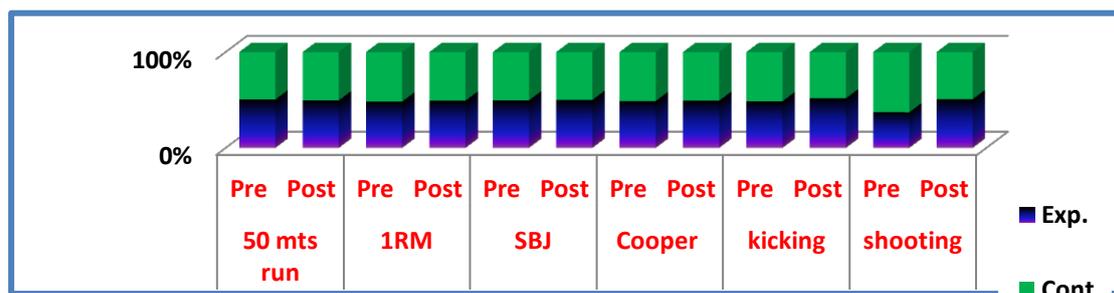
**III. Results**

**Table No.2 Mean values of research variables between Experimental and Control groups.**

Group		FITNESS VARIABLES								PERFORMANCE VARIABLES			
		50mt Run		HS(1RM)		SBJ		Cooper test		Kicking		Shooting	
		Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Exp.	Mean	6.26	6.14	125.25	130.95	278.05	283.95	2668.75	2700.25	20.00	22.90	2.90	4.65
	SD	0.11	0.11	10.63	10.10	14.31	14.38	149.87	151.54	1.48	1.87	0.68	1.12
Cont.	Mean	6.13	6.24	133.90	134.50	282.55	283.45	2787.25	2785.45	21.10	21.35	4.90	4.50
	SD	0.08	0.12	9.17	8.20	12.55	12.95	142.72	144.14	1.02	1.55	0.29	0.90

Above table shows the mean and Sd values of fitness variables and performance variables between pre-test and post-test of plyometric training and control groups. The experimental subjects were treated with plyometric exercises for twelve weeks training and control group subjects did not treat any specific training except regular soccer activities. After post test experimental subjects' fitness and soccer playing abilities were enhanced. However in control group subjects fitness and soccer playing abilities did not change much.

Graph No.1 Mean differences between Experimental and Control groups



Above graph shows the mean values of fitness and performance variables between pre-test and post-test of experimental and control groups. The experimental group are in green colour upper column and dark blue lower column indicated control group. After post test experimental subjects' fitness and soccer playing abilities were increased than control group.

**Table No.3 Statistical results between experimental and control group.**

Group	50mt Run		1RM		SBJ		Coop.		kicking		shooting	
	<i>t</i>	<i>F</i>	<i>t</i>	<i>F</i>	<i>t</i>	<i>F</i>	<i>t</i>	<i>F</i>	<i>t</i>	<i>F</i>	<i>t</i>	<i>F</i>
Ex.	6.39	7.57 0.01	-13.65	1.3 4	-12.13	2.5 0.01	-6.41	3 0.09	-16.45	7.34 0.01	-7.67	0.19 0.66
	.000		.000		.000		.000		.000		.000	
Cont.	-5.89	0.17	-1.41	0.2 5	-2.3	0.03	0.44	0.47	-0.73	0.08	1.79	
	.000		0.03		0.66		0.47					

Above table shows the statistical significance between pre test and post test on fitness and soccer playing ability variables between plyometric and control groups. There was a significant difference in mean between pre test and post test results on fitness and soccer performance abilities among experimental subjects, the significance was .000 in all variables which was below  $p < 0.05$  level however no significance mean difference in control group subjects except speed and leg explosive strength. The one way ANOVA tested the differences between the means of two groups and found there was significance difference in speed, leg explosive strength and kicking ability in soccer but no difference was found leg strength, endurance and shooting ability.

#### IV. Conclusions:

The analysis of the data for this study reveals that predictors which were fitness variables like speed, leg strength, leg explosive strength and cardio respiratory efficiency were influenced on soccer performance abilities like kicking and shooting among junior national soccer players. The statistical results also showed that there was significant difference in speed, leg strength, leg explosive strength and endurance as well as soccer performance abilities viz. kicking and shooting.

This study also stated that the performance of shooting ability and kicking ability of junior national soccer players, greatly influenced by the independent fitness variables through the treatment of plyometric than control group.

#### Recommendations:

- 1) Similar study may be conducted on psychological, physiological factors on junior soccer players.
- 2) Similar study may be conducted on female subjects.

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