



## Effects of Plyometric With and Without Functional Training on Selected Physical Fitness Variables of Intercollegiate Male Football Players

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### Abstract

The purpose of this study was to find out the effects of plyometric with and without functional training on selected Physical Fitness variables of intercollegiate male football players. To achieve the purpose of the study, sixty intercollegiate men football players from AVVM Sri Pushpam College, Poondi, Tanjore, Tamilnadu and Adaikala Madha Arts and Science College Tanjore, Tamilnadu were selected as subjects (30 from each college). They were divided into three equal groups in which each group consisted of twenty subjects (n=20). Group-I and Group-II were the experimental groups such as Plyometric Group with Functional Training – PGF and Plyometric Group without Functional Training - PG and Group-III served as control group (CG). Group I and II underwent training for a period of twelve weeks. The following are the criterion variables :Speed, Agility and Leg explosive Power. They were tested using standard test methods and instruments before and after training. The collected data were analysed using paired samples t test and ANCOVA. Whenever, the 'F' ratio for adjusted post-test was found to be significant, Scheffe's post hoc test was applied. The level of confidence was fixed at 0.05 level. The findings of the study showed that there were significant improvements in the variables namely Speed, Agility and Leg explosive Power between pretest and post-test of the two experimental groups. Better improvement was found in Plyometric with functional training group. There was no significant difference in any of the selected variables between pretest and post-test of the control group.

**Keywords:** Plyometric training, Functional Training, Speed, Agility and Leg explosive Power.

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### Introduction

Sports training is a basic preparation of sportsman for better performance through physical exercise. It is based on scientific principles of aiming at education and performance enhancement, the improvement of general health and organic functions as well as increasing the strength and stability of the musculo-skeletal system (Singh, 1991).

Plyometrics is the term now applied to exercises that have their roots in Europe, where they were first known simply as jump training. (Baechle, 1994). 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. (Haghighi et al, 2012). The ability to apply force rapidly (reactive force) is the major goal of plyometric training. (Thirumalaikumar, 2002).

Functional Training is how much certain movement will transfer into the actual activity of sport. It is a matter of neural complexity and central nervous system demand. The literal meaning of the word Functional is “designed to be practical and useful, rather than attractive”. It provides an added advantage and improves overall performance, thereby helping the sports people achieve their goals. (Alauddin Shaikh, 2012). Functional training involves training for specific skills of a game. Functional exercises are usually trained in upright positions and involve movements in multiple planes of motion simultaneously just like in sport (i.e. cricket, football, volleyball, athletics, etc.). (Deepak Kumar Dogra, 2015)

Functional training in football means the Training for a specific position or area of the field (like forwards, outside midfield, etc). Functional training involves training or practicing the specific demands of a position or a role. This can be for an individual player, or for a unit (i.e. defense). For example, A football coach may run a functional training session for forward play, dealing specifically how two forwards work together in attacking the third. Functional training should take place in the area of the field where that scenario would occur in a real game. The purpose of the present study was to find out the effects of plyometric training with functional

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training on Physical fitness variables of intercollegiate male football players.

### Materials and Methods

To achieve the purpose of this study, sixty intercollegiate men football players from AVVM Sri Pushpam College, Poondi, Tanjore, Tamilnadu and Adaikalamadha Arts and Science College Tanjore, Tamilnadu were selected as subjects at random (30 from each college). They were divided into three equal groups of twenty each (n=20). Group-I and Group-II were the experimental groups such as Plyometric Group with Functional Training – PGF and Plyometric Group without Functional Training - PG and Group-III served as control group (CG). Group I and II underwent training for a period of twelve weeks.

Eight upperbody plyometric exercises and fourteen lowerbody plyometric exercises were selected for the training. The upper body plyometric exercises were Overhead throw, overback toss, side throws, explosive start throws, slams, single arm overhead throw, squat throws and plyo-push ups. The lower body plyometric exercises were squat jumps, lateral jump to box, split squat jumps, tuck jump, lateral box push off, bounding, bounding with rings, box drill with rings, lateral hurdle jumps, single leg tuck jumps, zigzag hops, single leg lateral hops and depth jump.

### Results

Table 1

*Analysis of covariance for the pre test post test and adjusted post test means on speed of plyometric with and without functional training and control group*

	PFG	PG	CG	Source of Variance	Sum of Squares	df	Mean Squares	F-ratio
<b>Pre-Test Means</b>	7.53	7.55	7.54	<b>BG</b>	0.002	2	0.001	0.51
				<b>WG</b>	0.137	57	0.002	
<b>Post-Test Means</b>	6.41	6.74	7.53	<b>BG</b>	13.22	2	6.611	109.51*
				<b>WG</b>	3.44	57	0.06	
<b>Adjusted Post-Test Means</b>	6.42	6.73	7.53	<b>BG</b>	13.04	2	6.52	110.27*
				<b>WG</b>	3.31	56	0.059	

PFG - Plyometric with functional training Group CG - Control Group PG – Plyometric without functional training Group  
df- Degrees of Freedom BG - Between Group Means WG - Within Group Means

\* - Significant

(Table Value for 0.05 Level for df 2 & 57 = 3.16)(Table Value for 0.05 Level for df 2 & 56 = 3.17)

Table 2

*Scheffe's test for the difference between paired means on speed*

Group I	Group II	Group III	Mean Difference	CI value
6.42	6.73	-	0.31*	0.194
6.42	-	7.53	1.11*	
-	6.73	7.53	0.8*	

\*Significant at 0.05 level of confidence.

Figure 1

Adjusted post test mean values of plyometric with and without functional training and control group on speed

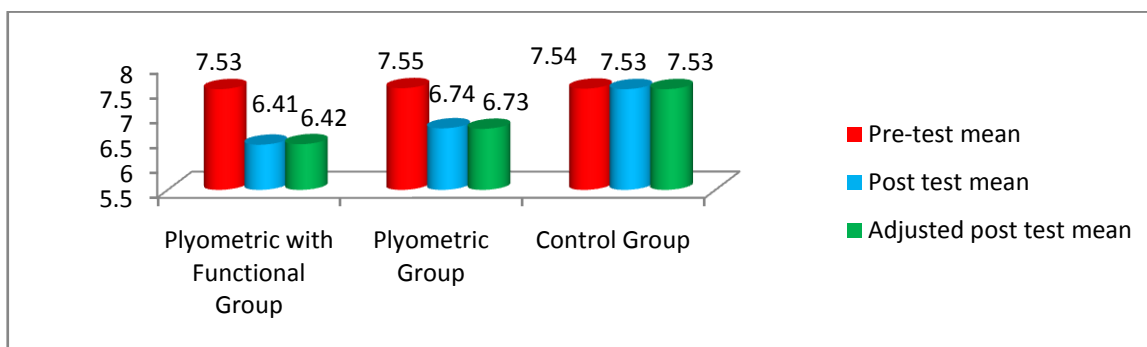


Table 3

Analysis of covariance for the pre test post test and adjusted post test means on agility of plyometric with and without functional training and control group

	PFG	PG	CG	Source of Variance	Sum of Squares	df	Mean Squares	F-ratio
Pre-Test Means	15.87	15.88	15.88	BG	0.002	2	0.001	0.07
				WG	0.700	57	0.012	
Post-Test Means	13.99	14.90	15.87	BG	36.09	2	18.05	645.57*
				WG	1.594	57	0.028	
Adjusted Post-Test Means	13.99	14.89	15.88	BG	35.63	2	17.81	1237*
				WG	0.806	56	0.014	

PFG - Plyometric with functional training Group

CG - Control Group

PG – Plyometric without functional training Group

WG - Within Group Means

\* - Significant

df- Degrees of Freedom

BG - Between Group Means

(Table Value for 0.05 Level for df 2 & 57 = 3.16)

(Table Value for 0.05 Level for df 2 & 56 = 3.17)

Table 4

Scheffe's test for the difference between paired means on agility

Group I	Group II	Group III	Mean Difference	CI value
13.99	14.89	-	0.90*	0.094
13.99	-	15.88	1.89*	
-	14.89	15.88	0.99*	

\*Significant at 0.05 level of confidence.

Figure II

Adjusted post test mean values of plyometric with and without functional training and control group on agility

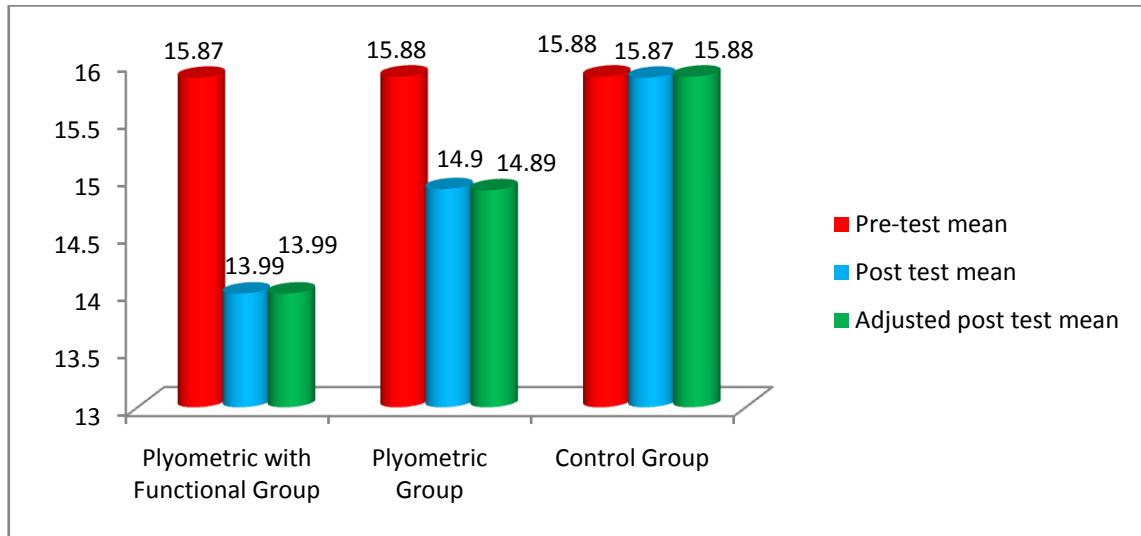


Table 5

Analysis of covariance for the pre test post test and adjusted post test means on leg explosive power of plyometric with and without functional training and control group

	PFG	PG	CG	Source of Variance	Sum of Squares	df	Mean Squares	F-ratio
<b>Pre-Test Means</b>	232.95	232.35	233.55	<b>BG</b>	15.4	2	7.2	0.245
				<b>WG</b>	1676.45	57	29.41	
<b>Post-Test Means</b>	242.65	239.65	232.60	<b>BG</b>	1064.7	2	532.35	20.07*
				<b>WG</b>	1511.9	57	26.53	
<b>Adjusted Post-Test Means</b>	242.6	240.1	232.1	<b>BG</b>	1204.76		602.38	79.26*
				<b>WG</b>	425.59		7.6	

Table 4

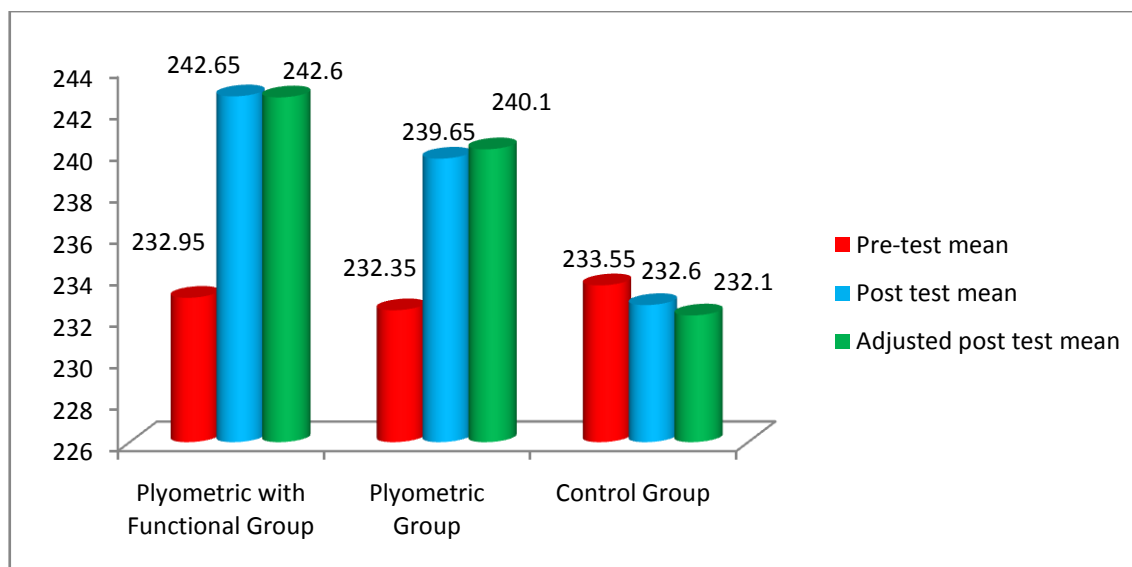
Scheffe's test for the difference between paired means on leg explosive power

Group I	Group II	Group III	Mean Difference	CI value
242.6	240.1	-	2.5*	2.197
242.6	-	232.1	10.5*	
-	240.1	232.1	8*	

\*Significant at 0.05 level of confidence.

Figure III

Adjusted post test mean values of plyometric with and without functional training and control group on leg explosive power



### Discussion

The results of 't'-test showed that there was significant difference in both the experimental groups between pre and post tests for all the criterion variables. The results of the ANCOVA showed that there was no significant difference among the pre-test means of Plyometric with and without functional training groups and control group on the selected variables. There was a significant difference among the post test means and also adjusted post-test means of the experimental and control groups. Since the obtained 'F' ratio value was significant and further to find out the paired mean difference, the Scheffe's test was employed for every variable. The post hoc analysis showed that there was significant improvement in the criterion variables in both the experimental groups than the control group. Further it was found that better improvement was in experimental group – I.

### Conclusion

It was found that the control group had insignificant difference than the Plyometric with functional training group and Plyometric without functional training group on the selected criterion variables of the intercollegiate male football players. It was concluded that all the selected criterion variables namely Speed, Agility and Leg explosive Power of the intercollegiate male football players showed better improvement in Plyometric with functional training group. Hence through this study it is suggested that the better training method to improve the Physical fitness variables of the intercollegiate male football players was Plyometric with functional training compared with the Plyometric training alone.

### References

1. Alauddin Shaikh, Mondal, S. (2012). "Effect of functional training on physical fitness components on college male students-a pilot study." *Journal of Humanities and Social Science*.1: (2):1-5.
2. Baechle T.R. and R.W. Earle. (2000). *Essentials of strength training and conditioning*, 2nd edition. Champaign, IL: National Strength and Conditioning Association.
3. Deepak K Dogra (2015), Effect of functional interval endurance training programme on cardio-respiratory endurance and muscular endurance of Tripura cricketers, *International Journal of Computer Engineering and Technology*, 6(1): 27-31
4. Haghghi A, Moghadasi M, A. Nikseresht, A. Torkfar and M.Haghghi (2012), Effects of plyometric versus resistance training on sprint and skill performance in young football players. *Eur J ExpBiol*, 2:2348-2351.
5. Singh Hardayal (1991), "Science of Sports Training", New Delhi, D.V.S. Publications.
6. Thirumalaikumar. S (2002), "Plyometrics", *Journal of Physical Education and Sports*, 13, (August), 17.