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IMPACT OF FUNCTIONAL AND PLYOMETRIC TRAINING ON SELECTED PHYSICAL VARIABLES AMONG MALE CRICKETERS

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Abstract

The purpose of the study was to find out the impact of functional training and plyometric training on selected physical variables namely speed, explosive power and muscular strength among male cricketers. To achieve the purpose of the study forty five male Cricketers have been randomly selected from Anna University, BIT Campus – Tiruchirappalli-24, Tamilnadu, India. The age of subjects were ranged from 19 to 23 years. The subjects had past experience of at least two years in cricket and only who those represented their respective college teams were taken as subjects. A series physical fitness tests was carried out on each participant. These included speed assessed by 30mts dash, muscular strength assed by sit ups explosive powerassessed by standing broad jump and standing vertical jump. The subjects were randomly assigned into three groups of fifteen each, such as two experimental group and control group. The experimental group participated functional training and plyometric training for 3 days a week, one session every alternate day and for 8 weeks each session lasted up to 60 minutes. The control group maintained their daily routine activities and there was no special training was given to them. The subjects of the three groups were tested on selected variables prior and immediately after the training period. The collected data were analyzed statistically through analysis of covariance (ANCOVA) to find out the significance difference, if any between the groups. The 0.05 level of confidence was fixed to test the level of significance difference, if any between groups. The results of the study showed that there was significant level differences exist between Functional training group, plyometric training group and control group. Functional training group showed significant improvement on speed and sit-ups and Plyometric training group showed significant improvement on Explosive power compared to control group.

Key words: Functional training, Plyometric training, speed andExplosive power.

Introduction

Function is, essentially purpose. Functional training can therefore be described as purposeful training. Functional training has been mislabelled by many athletes and coaches as "sport specific" which implies that certain movements and movement patterns are specific to individual sports. In fact functional training is more accurately represented as "sports general" training. The "sports general" school of thought views most sports as far more similar than different. Action such as sprinting, striking, jumping and moving laterally are general skills that apply for many sports. (Boylee, 2007). Functional training, if performed correctly can lead to better joint mobility and stability, as well as more efficient motor patterns. Improving these factors decreases the potential for an injury sustained during an athletic endeavour performance in a sport. Functional training attempts to adapt or develop exercises which allow individuals to perform the activities of daily life more easily and without injuries (Cannone, 2007). Functional training exercises could serve as an alternative and potentially more creative method for improving performance in college student and as well as to be applied to all the sports persons of all elementary level to international levels (Alauddin Shaikh and Samiran Mondal, 2012). An exercise continuum involving balance and proprioception, performed with the feet on the ground such that strength is displayed in unstable conditions and body weight is managed in all movement planes. Functional training may lead to better muscular balance and joint stability, possibly decreasing the number of injuries sustained in an individual's performance in a sport (Steven Plisk- NSCA). Functional training increasing the strength,

speed, endurance, and flexibility has a major factors impact on performance (Cannone, 2003). In the theory of strength training, the specific training for the increase of explosive type strength is referred to as "plyometric training" and the training method is called the "plyometric method". "Plyometrics is a speed -strength training, a combination of strength and speed" (Marullo, 1999). The fundamental principle of the plyometric method lies in the speed of the shift from and to the eccentric and concentric muscle contractions. "The key to this lies in the time needed for one muscle to shift from a state of flexibility (the stretch) into a state of shortening (the return to its original position). This points to the fundamental principle of plyometric training: the measurement, the extent of the stretch (the degree), determines these of the strength that allows flexibility and the transformation of chemical energy into energy used to move muscles" (Kostic, 1999).

The purpose of the study was to find out the impact of Functional training and Plyometric training on selected physical variables namely speed, explosive power and muscular strength among male Cricket players.

Methods

To achieve the purpose of the study forty five male cricketers have been selected from Anna University, BIT Campus – Tiruchirappalli-24, Tamilnadu, India. The age of subjects were ranged from 19 to 23 years. The subjects had past experience of at least two years in cricket and only those who represented their respective college teams were taken as subjects. Physical fitness tests were carried out on each participant with care. These included speed assessed by 30 meters sprint, muscular strength assessed by sit-ups, explosive power assessed by standing broad jump and

standing vertical jump. The subjects were randomly assigned into three groups of fifteen each, such as experimental I, experimental II and control groups. The experimental group participated functional training and plyometric training for 3 days a week, one session every alternate day and for 8 weeks each session lasted 60 minutes. The control group maintained their daily routine activities and no special training was

given. The subjects of the three groups were tested on selected variables prior and immediately after the training period. The collected data were analyzed statistically through analysis of covariance (ANCOVA) to find out the significance difference, if any between the groups. The 0.05 level of confidence was fixed to test the level of significance difference, if any between groups.

TABLE-I
Criterion measures

S.No	Criterion measure	Test items	Unit of measurement
1	Speed	30 meter sprint	In seconds
2	Muscular strength	Sit ups	In numbers
3	Explosive power	Vertical jump	In centimeters
4	Explosive power	Standing broad jump	In centimeters

TABLE - II
Descriptive analysis of selected physical variables among control and experimental groups

S.No	Variables	Group	Pre-Test Mean	SD (\pm)	Post -Test Mean	SD (\pm)	Adjusted Mean
1	Speed	CG	5.2	0.22	5.1	0.20	5.1
		FTG	5.2	0.27	4.7	0.20	4.6
		PTG	5.3	0.19	4.9	0.22	5.02
2	Standing broad jump	CG	2.53	0.13	2.5	0.13	2.5
		FTG	2.53	0.13	2.7	0.12	2.6
		PTG	2.50	0.13	2.8	0.12	2.8
3	Vertical jump	CG	27.13	2.1	28.3	2.58	28.2
		FTG	27.13	2.2	32.93	2.54	32.8
		PTG	26.93	2.2	36.6	2.74	36.7
4	Sit ups	CG	34.7	3.7	35.06	3.5	35.2
		FTG	34.8	3.2	43.86	3.6	43.9
		PTG	35.1	3.1	46.46	3.2	46.2

PTG= Plyometric training group, FTG= Functional training group, CG= Control group

The tables-II the pre, post-test means, standard deviations and adjusted means on selected physical variables of male Cricketers were numerical presented. The analysis of

covariance on selected variables of Functional training, Plyometric training and control group is presented in table III.

TABLE – III
Computation of analysis of covariance on selected physical variables
among male cricketers

S.No	variables	Test	Sum of variance	Sum of squares	df	Mean square	F ratio
1	Speed	Pre-test	Between groups	0.084	2	0.042	0.771
			Within groups	2.288	42	0.054	
		Post-test	Between groups	1.506	2	0.753	17.136
			Within groups	1.845	42	0.044	
		Adjusted means	Between sets	1.988	2	0.994	100.36
			Within sets	0.406	41	0.010	
2	Standing broad jump	Pre-test	Between groups	0.008	2	0.004	0.225
			Within groups	0.789	42	0.019	
		Post-test	Between groups	0.578	2	0.289	17.343
			Within groups	0.700	42	0.017	
		Adjusted means	Between sets	0.677	2	0.338	213.46
			Within sets	0.065	41	0.002	
3	Vertical jump	Pre-test	Between groups	0.400	2	0.200	0.040
			Within groups	210.400	42	5.010	
		Post-test	Between groups	514.711	2	257.356	37.289
			Within groups	289.867	42	6.902	
		Adjusted means	Between sets	539.740	2	269.870	207.31
			Within sets	53.371	41	1.302	
4	Sit-ups	Pre-test	Between groups	1.244	2	0.622	0.054
			Within groups	488.400	42	11.629	
		Post-test	Between groups	1070.800	2	535.400	44.057
			Within groups	510.400	42	12.152	
		Adjusted means	Between sets	1007.386	2	503.693	445.50
			Within sets	46.355	41	1.131	

*Significant at 0.05 level of confidences

(Table value for df 2 and 42 was 3.21, Table value for df 2 and 41 was 3.22)

The obtained F-ratio of 100.36 for adjusted mean was greater than the table value 3.22 for the degree of freedom 2 and 41 required for significance at 0.05 level of confidence. The result of the study indicates that there was a significant level difference among control and experimental groups on Speed. The above table also indicates that pre test of control and experimental groups

did not differ significantly and post test of control and experimental groups have significant difference on 30mtr timing.

The obtained F-ratio of 213.46 for adjusted mean was greater than the table value 3.22 for the degree of freedom 2 and 41 required for significance at 0.05 level of confidence. The result of the study indicates that there was a significant

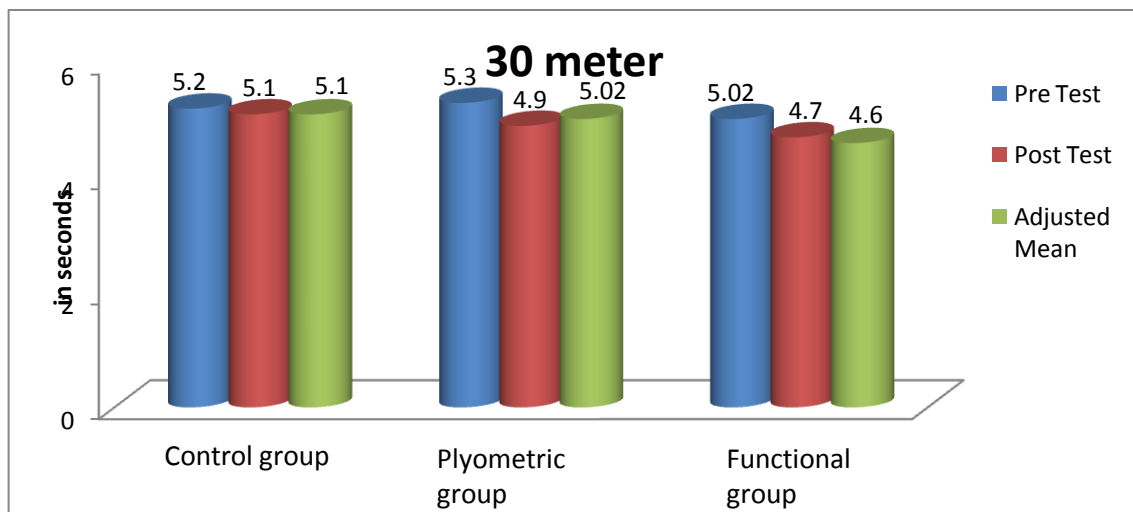
level difference among control and experimental groups on standing broad jump. The above table also indicates that pre test of control and experimental groups did not differ significantly and post test of control and experimental groups have significant difference on standing broad jump.

The obtained F-ratio of 207.31 for adjusted mean was greater than the table value 3.22 for the degree of freedom 2 and 41 required for significance at 0.05 level of confidence. The result of the study indicates that there was a significant level difference among control and experimental groups on vertical jump. The above table also indicates that pre test of control and experimental groups did not differ significantly and post test of control and experimental groups have significant difference on vertical jump levels.

The obtained F-ratio of 445.50 for adjusted mean was greater than the table value 3.22 for the degree of freedom 2 and 41 required for significance at 0.05 level of confidence. The result of the study indicates that there was a significant difference level among control and experimental groups on forced sit-up. The above table also indicates that pre test of control and experimental groups did not differ significantly and post test of control and experimental groups have significant difference on sit-ups.

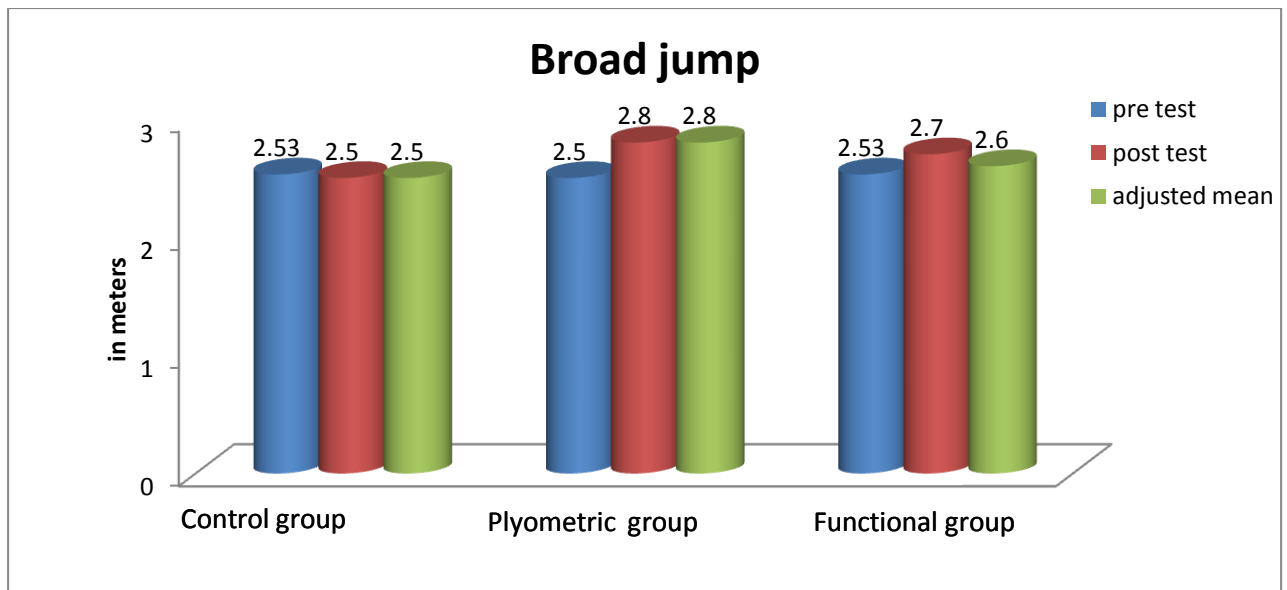
Since the F value was significant, the scheffe's post hoc test was further computed to find out which pair of group was high among the others and the results are tabulated in the table no. IV

Figure-I



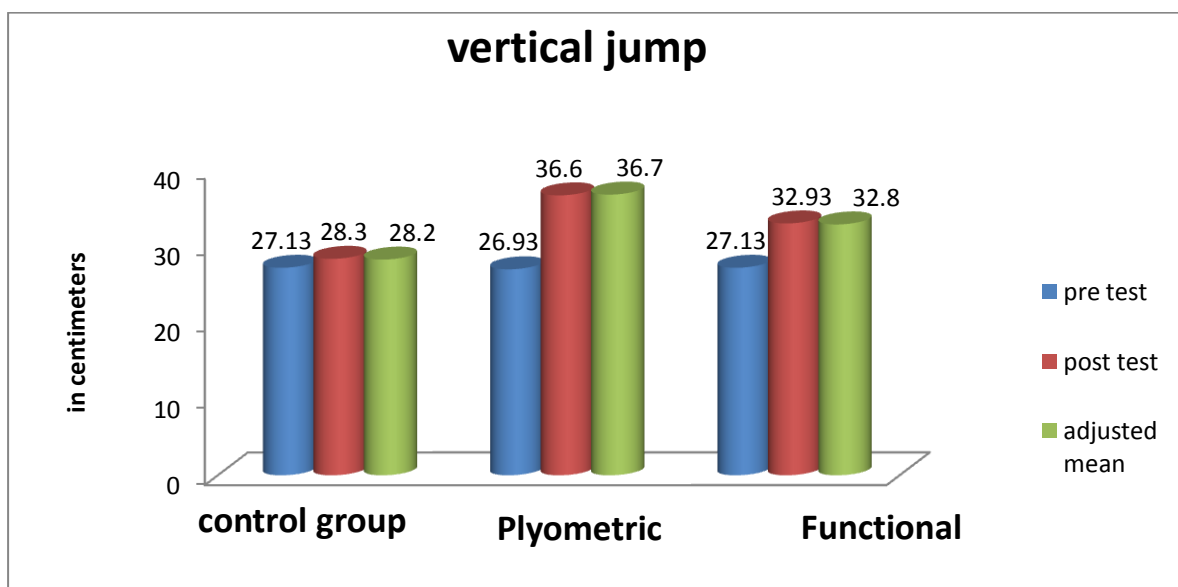
The pre, post and adjusted mean values of speed control and Plyometric and Functional training groups are graphically represented in the figure-I

Figure-II



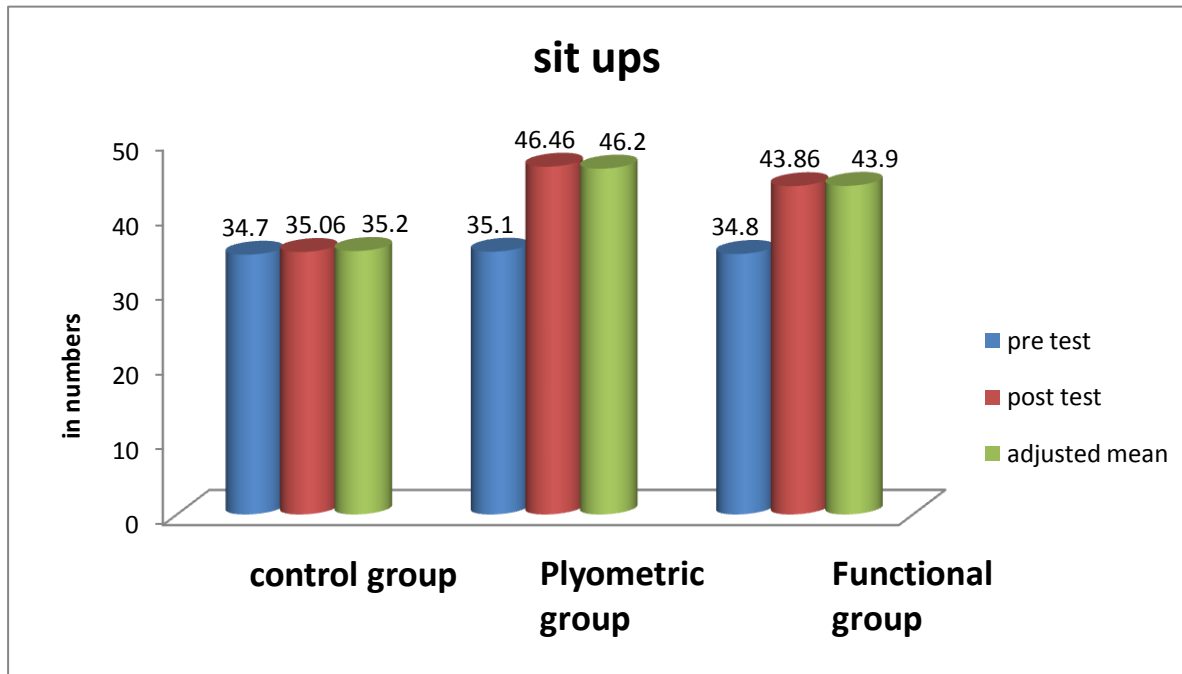
The pre, post and adjusted mean values of standing broad jump control, Plyometric and Functional training groups are graphically represented in the figure-II

Figure - III



The pre, post and adjusted mean values of standing vertical jump control, Plyometric and Functional training groups are graphically represented in the figure-III

Figure - IV



The pre, post and adjusted mean values of sit ups of control, Plyometric and Functional training groups are graphically represented in the figure-IV

SCHEFFE’S POST – HOC TEST FOR MEAN DIFFERENCES BETWEEN THE ADJUSTED POST TESTS PAIRED MEANS

Table IV

S.No.	Variable	Control	Functional	Plyometric	M D	C.I
1	Speed	5.1	4.6	-	0.5*	0.06
		-	4.6	5.02	0.42*	
		5.1	-	5.02	0.08*	
2	Standing broad jump	2.5	2.6	-	0.1*	0.03
		-	2.6	2.8	0.2*	
		2.5	-	2.8	0.3*	
3	Vertical jump	28.2	32.8	-	4.6*	0.73
		-	32.8	36.7	3.9*	
		28.2	-	36.7	8.5*	
4	Sit ups	35.2	43.9	-	8.7*	0.69
		-	43.9	46.2	2.3*	
		35.2	-	46.2	11* 88	

From the table – IV, in speed there was a significant mean difference observed between control and functional training group (0.5), control and plyometric training group (0.08) and functional training group and plyometric training group (0.42). In standing broad jump there was a significant mean difference observed between control and functional training group (0.1), control and plyometric training group (0.3) and functional training group and plyometric training group (0.2). In vertical jump there was a significant mean difference observed between control and functional training group (4.6), control and plyometric training group (8.5) and functional training group and plyometric training group (3.9). In sit-ups there was a significant mean difference observed between control and functional training group (8.7), control and plyometric training group (11) and functional training group and plyometric training group (2.3).

Discussion of findings

The results of the study indicate that the experimental group which underwent Functional training group showed significant improvement on speed and sit-ups and Plyometric training group showed significant improvement on Explosive power compared to control group. The control group did not show significant improvement in any of the selected variables.

Conclusions

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

1. The experimental group Cricketers showed significant improvement in all the selected physical variables namely speed, explosive power and muscular strength.
2. The control group Cricketers did not show significant improvement in any of selected variables.

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