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Effect of Plyometric and Functional Core Training on Selected Body Composition among Basketball Players

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Abstract

The purpose of the study was to find out the effect of plyometric and functional core training on selected body composition among basketball players. To achieve the purpose of the present study, forty five men basketball players from Ernakulam district, Kerala state, India were selected as subjects at random and their ages ranged from 18 to 25 years. The subjects were divided into three equal groups of fifteen subjects each. The subjects (N=45) were randomly assigned to three equal groups of fifteen subjects each. Pre test was conducted for all the subjects on selected body composition variables. This initial test scores formed as pre test scores of the subjects. The groups were assigned as Experimental Group I, Experimental Group II and Control Group in an equivalent manner. Experimental Group I was exposed to plyometric training, Experimental Group II was exposed to functional core training and Control Group was not exposed to any experimental training other than their regular daily activities. The duration of experimental period was 12 weeks. After the experimental treatment, all the forty five subjects were tested on their body composition variables. This final test scores formed as post test scores of the subjects. The pre test and post test scores were subjected to statistical analysis using Analysis of Covariance (ANCOVA) to find out the significance among the mean differences, whenever the 'F' ratio for adjusted test was found to be significant, scheffe's post hoc test was used. In all cases 0.05 level of significance was fixed to test hypotheses. The plyometric training had decreased BMI and percent body fat than the control group. The functional core training had decreased BMI and percent body fat than the control group.

Keywords: Plyometric, Core Training, BMI, Percent Body Fat, Basketball.

Introduction

Basketball is one of the sports characterized by many of the basic and variable skills. One of the most important components of basketball is the ability to jump vertically. It is necessary to assess an athlete jumping ability and strength levels before beginning the design of the training program. Nature is such that if polymeric exercises are performed with maximum effort, the muscle can increase the opinion of many exercise physiologists, neural adaptations - the explosive power that affects muscles in 2 to 4 weeks you first start training occurs. Plyometric and weight training 3 times a week will run only when sufficient recovery time between training sessions exist. Plyometrics training is one such training strategy to improve the performance of the basketball players as the training approximates their basic needs of agility and power; allows the muscle to reach exponential increase in the maximum strength and speed of movement in the shortest duration. The training typically involves stretch-shortening cycle of muscle groups and those movements consist of eccentric, amortization and concentric phases. The shorter the duration of all three phases and more specifically the amortization phase, greater will be the development of exploratory power of the muscles being exercised (Donald, 1998). Functional training is a classification of exercise which involves training the body for the activities performed in daily life. Functional training has its origins in rehabilitation. Functional training attempts to adapt or develop exercises which allow individuals to perform the activities of daily life more easily and without injuries. In the context of body building, functional training involves mainly weight bearing activities targeted at core muscles of the abdomen and lower back (Cannone, 2007).

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Methodology

The purpose of the study was to find out the effect of plyometric and functional core training on selected body composition among basketball players. To achieve the purpose of the present study, forty five men basketball players from Ernakulam district, Kerala state, India were selected as subjects at random and their ages ranged from 18 to 25 years. The subjects were divided into three equal groups of fifteen subjects each. The subjects (N=45) were randomly assigned to three equal

groups of fifteen subjects each. Pre test was conducted for all the subjects on selected body composition variables. This initial test scores formed as pre test scores of the subjects. The groups were assigned as Experimental Group I, Experimental Group II and Control Group in an equivalent manner. Experimental Group I was exposed to plyometric training, Experimental Group II was exposed to functional core training and Control Group was not exposed to any experimental training other than their regular daily activities. The duration of experimental period was 12 weeks. After the experimental treatment, all the forty five subjects were tested on their body composition variables. This final test scores formed as post test scores of the subjects. The pre test and post test scores were subjected to statistical analysis using Analysis of Covariance (ANCOVA) to find out the significance among the mean differences, whenever the 'F' ratio for adjusted test was found to be significant, scheffe's post hoc test was used. In all cases 0.05 level of significance was fixed to test hypotheses.

Results and Discussion

The detailed procedure of analysis of data and interpretation were given below,

Table I. Computation of analysis of covariance of mean of plyometric and functional core training and control groups on BMI

	Plyometric Training	Functional Core Training	Control Group	Source of Variance	Sum of Squares	df	Means Squares	F-ratio
Pre-Test Means	24.80	24.91	24.24	**BG**	3.84	2	1.92	1.23
				WG	65.64	42	1.56	
Post-Test Means	22.26	22.11	24.14	**BG**	38.57	2	19.28	12.55*
				WG	64.53	42	1.53	
Adjusted Post-Test Means	22.19	22.00	24.31	**BG**	46.33	2	23.16	17.65*
				WG	53.78	41	1.31	

An examination of table - I indicated that the pre test means of plyometric, functional core training and control groups were 24.80, 24.91 and 24.24 respectively. The obtained F-ratio for the pre-test was 1.23 and the table F-ratio was 3.22. Hence the pre-test mean F-ratio was insignificant at 0.05 level of confidence for the degree of freedom 2 and 42. This proved that there were no significant difference between the experimental and control groups indicating that the process of randomization of the groups was perfect while assigning the subjects to groups. The post-test means of plyometric, functional core training and control groups were 22.26, 22.11 and 24.31 respectively. The obtained F-ratio for the post-test was 12.55 and the table F-ratio was 3.22. Hence the post-test mean F-ratio was significant at 0.05 level of confidence for the degree of freedom 2 and 42. This proved that the differences between the post test means of the subjects were significant. The adjusted post-test means of plyometric, functional core training and control groups were 22.19, 22.00 and 24.31 respectively. The obtained F-ratio for the adjusted post-test means was 17.65 and the table F-ratio was 3.23. Hence the adjusted post-test mean F-ratio was significant at 0.05 level of confidence for the degree of freedom 2 and 41. This proved that there was a significant difference among the means due to the experimental trainings on BMI. Since significant differences were recorded, the results were subjected to post hoc analysis using Scheffe's post hoc test. The results were presented in Table –II.

Table II. The scheffe's test for the differences between the adjusted post test paired means on BMI

Adjusted Post-test means			Mean Difference	Required CI
Plyometric Training	**Functional Core Training**	**Control Group**		
22.19	22.00	---	0.19	1.06
22.19	---	24.31	2.12*	
---	22.00	24.31	2.31*	

**** Significant at 0.05 level of confidence***

The multiple comparisons showed in Table II proved that there existed significant differences between the adjusted means of plyometric training with control group (2.12), functional core training with control group (2.31). There was no significant difference between plyometric training and functional core training (0.19) at 0.05 level of confidence with the confidence interval value of 1.06. The pre, post and adjusted means on BMI were presented through bar diagram for better understanding of the results of this study in Figure-I.

Figure I. Pre post and adjusted post test differences of the, plyometric training, functional core training and control groups on BMI

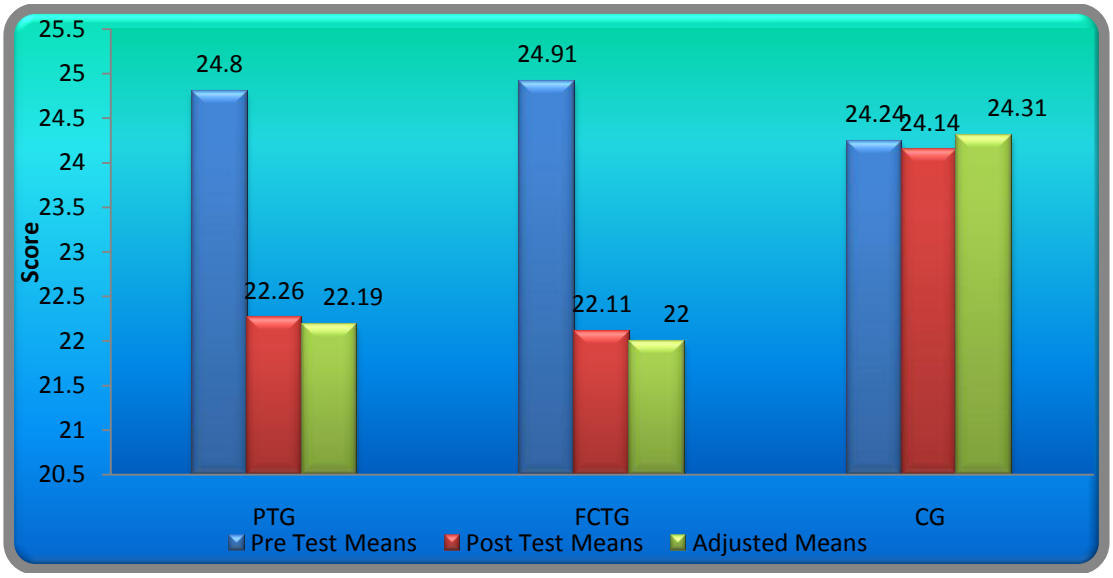


Table III. Computation of analysis of covariance of mean of plyometric and functional core training and control groups on percent body fat

	Plyometric Training	Functional Core Training	Control Group	Source of Variance	Sum of Squares	df	Means Squares	F-ratio
Pre-Test Means	18.01	18.43	18.39	**BG**	1.66	2	0.83	1.13
				WG	30.65	42	0.73	
Post-Test Means	16.13	15.11	18.03	**BG**	65.81	2	32.90	16.68*
				WG	82.82	42	1.97	
Adjusted Post-Test Means	16.23	15.06	17.99	**BG**	65.42	2	32.71	17.09*
				WG	78.43	41	1.91	

An examination of table - III indicated that the pre test means of plyometric, functional core training and control groups were 18.01, 18.43 and 18.39 respectively. The obtained F-ratio for the pre-test was 1.13 and the table F-ratio was 3.22. Hence the pre-test mean F-ratio was insignificant at 0.05 level of confidence for the degree of freedom 2 and 42. This proved that there were no significant difference between the experimental and control groups indicating that the process of randomization of the groups was perfect while assigning the subjects to groups. The post-test means of plyometric, functional core training and control groups were 16.13, 15.11 and 18.03 respectively. The obtained F-ratio for the post-test was 16.68 and the table F-ratio was 3.22. Hence the post-test mean F-ratio was significant at 0.05 level of confidence for the degree of freedom 2 and 42. This proved that the differences between the post test means of the subjects were significant. The adjusted post-test means of plyometric, functional core training and control groups were 16.23, 15.06 and 17.99 respectively. The obtained F-ratio for the adjusted post-test means was 17.09 and the table F-ratio was 3.23. Hence the adjusted post-test mean F-ratio was significant at 0.05 level of confidence for the degree of freedom 2 and 41. This proved that there was a significant difference among the means due to the experimental trainings on percent body fat. Since significant differences were recorded, the results were subjected to post hoc analysis using Scheffe's post hoc test. The results were presented in Table-IV.

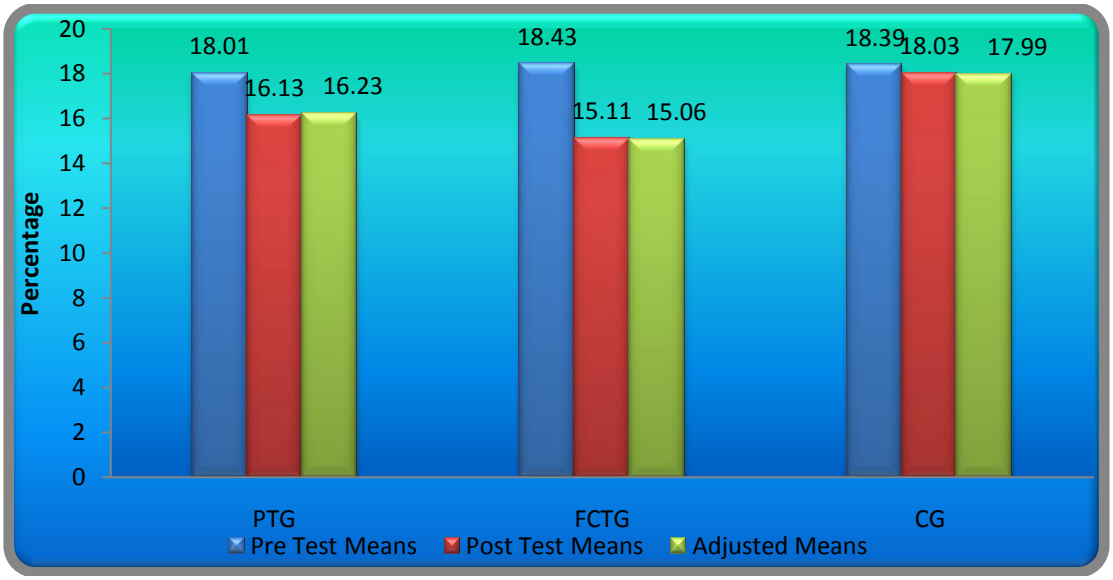
Table IV. The scheffe's test for the differences between the adjusted post test paired means on percent body fat

Adjusted Post-test means			Mean Difference	Required CI
Plyometric Training	Functional Core Training	Control Group		
16.23	15.06	---	1.17	1.28
16.23	---	17.99	1.76*	
---	15.06	17.99	2.93*	

**** Significant at 0.05 level of confidence***

The multiple comparisons showed in Table IV proved that there existed significant differences between the adjusted means of plyometric training with control group (1.76), functional core training with control group (2.93). There was no significant difference between plyometric training and functional core training (1.17) at 0.05 level of confidence with the confidence interval value of 1.28. The pre, post and adjusted means on percent body fat were presented through bar diagram for better understanding of the results of this study in Figure-II.

Figure II. Pre post and adjusted post test differences of the, plyometric training, functional core training and control groups on percent body fat



Conclusions

In the light of the study undertaken with certain limitations imposed by the experimental conditions, the following conclusions were drawn.

1. The plyometric training had decreased BMI and percent body fat than the control group.
2. The functional core training had decreased BMI and percent body fat than the control group.

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