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Effect of Plyometric and Weight Training on Selected Physiological Variable of Football Players

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Abstract: The purpose of this study was to find out the effect of Plyometric and weight training on selected physiological variable of football players. Total Sixty (60) male football players were selected as subject randomly who participated in the national level competition from Manipur University, Canchipur. They were divided into three equal groups and designated as experimental group (I), experimental group (II) and control group (III). Plyometric training was given to experimental group (I), Weight training was given to experimental group (II) and even though, the control group was allowed to attain their daily physical activity programme, they were not allowed to participate in the experimental treatment. The groups were administered initial tests on physiological variable. After the initial test, the Plyometric and Weight training were administered to the two experimental groups, where no special training was administered to the control group. The training was administered for the period of twelve (12) weeks, four (4) days in a week in progressive manner. To find out the significance of difference between pre and post – test means't' test was employed. The level of significant was set at 0.05 levels. To find out the significance of mean difference among pre – test, post- test and adjusted means and analysis of variance techniques were employed.
Keywords: Plyometric training, Weight training, Resting Pulse Rate, Football.

INTRODUCTION

Football is popular game in the world. The spectators and the players enjoy the game. Now a days with the demand for "high sports performance" the concept of football, has been changed. The concept of football" applies skill development, tactical development, development of all important motor components and physiological parameters which are closely associated and contributes to performance in football. Not only technical, physiological development, the sports scientists are also making efforts to develop the intellectual ability of the football players [1]. As in the literature has been shown that endurance, speed, agility, maximum leg strength, upper body strength, leg power, muscular endurance, flexibility, coordination and reaction time are important pre requisites for efficient football performance.

Genetic factor may play a major role in performance capacity of a person. The environment and geographic locations also have a considerable role over the performance. Adding to this, the performance of an individual depends upon the physical and motor fitness qualities in which a definite improvement can be achieved by appropriate training [3]. Plyometric training is used to improve maximum strength and speed of movement which result in an increase of explosive power. It is dynamic in nature, practice with movements similar in nature and speed to the skill or events for which one is trained. It stimulates quick movements better than most weight lifting; this training method should be supplemented to a weight training programme [4].

Power is an essential ingredient for most sports and games. The player is considered to be in good form when one can able to use the power effectively, combined with skill. Explosive power can be developed through weight training exercises, along with strength and flexibility. A combination of weight training and plyometric exercises has gained popularity as a strategy to improve muscle power and athletic performance [2]. It also directly or indirectly effect on physiological variable i.e resting pulse rate.

Objectives of the study

The main objective of the study was to find out the effect of plyometric and weight training on selected physiological variable of football players.

Hypothesis

It was hypothesized that there will be significance different of plyometric and weight training on selected physiological variable of football players

METHODOLOGY

Selection of subjects

The purpose of the study was to find out the effect of Plyometric and weight training on selected physiological variable namely resting pulse rate among football players of Manipur University. Total 60 male football players were selected at random from Manipur University who participated in the national level competition, their age range of subjects between 18-24 years. They were divided into three equal groups and each group consists of 20 subjects. Group (I) underwent Plyometric training and Group (II) underwent weight training for four days per week for 12 weeks and Group (III) acted as a control who did not involve any special training apart from the regular curricular activities.

Experimental Design

For the purpose of this study, parallel group design was used. Total 60(sixty) male football players have been selected randomly from Manipur University who have been participated in the national level competition. They were divided into three equal groups and designated as experimental group (I), experimental group (II) and control group (III). Plyometric training was given to experimental group (I) and Weight training was given to experimental group (II). Even though, the control group was allowed to attain their daily physical activity programme, they were not allowed to participate in the experimental treatment. The training programme was conducted weekly for four days from 3.00 p.m. to 4.00 p.m. at Football ground of Manipur University. The period of training was four days in a week for 12 weeks. The subjects were tested as resting pulse rate at initially test before given any experimental training (Pre-test) and at the end of the experimental specific training period (Post-test).The training schedule for the experimental groups were designed as per the results of the pilot study.

RESULTS

Table-1: Analysis of Covariance for Pre-Test and Post-Test Data on Resting Pulse Rate of Experimental Groups and Control Group

	Plyometric Training	Weight Training	Control Group	Sum of squares	Df	Mean square	'F' ratio
Pre-test							
Mean	72.70	72.90	72.75	0.850	3	0.283	0.24
S.D.	1.12	1.071	1.019	86.70	76	1.141	
Post-test							
Mean	70.75	70.85	72.90	82.33	3	27.44	24.87*
S.D.	1.118	1.089	1.020	83.850	76	1.103	
Adjusted							
Post-test Mean	70.86	70.78	72.96	90.39	3	30.13	145.2*
				15.55	75	0.207	

*Significant at 0.05 level

(The table value required for significance at 0.05 levels with df 3 and 76 and 3 and 75 are 2.73)

Table-1 shows that the pre-test mean on resting pulse rate of experiment group (I) underwent Plyometric training, experiment group (II) underwent weight training and control group (III) are 72.70,72.90, and 72.75 respectively and the obtained 'F' ratio is 0.248. Since then obtain F-ratio for the pre-test mean on resting pulse rate fail to reach the required table value of 2.73. It found to be insignificant at 0.05 level of confidence for 3, 76 degree of freedom.

The post-test means on resting pulse rate of plyometric training group, weight training group and control group are 70.75, 70.85 and 72.90 respectively and obtained 'F' ratio is 24.876. Since the obtained 'F' ratio is for the post-test mean on resting pulse rate is higher than the required table value of 2.73, it found to be significant at 0.05 level of confidence for 3, 76 degrees of freedom. The results reveal that due to the above said training resting pulse rate reduced significantly.

The adjusted post-test means on resting pulse rate of Plyometric training, weight training group and control group are 70.86, 70.78 and 72.96 respectively and the obtained 'F' ratio is 145.28. Since the obtained 'F' ratio for adjusted post-test means on resting pulse rate is higher than the required table value of 2.73, it is found to be significant at 0.05 level of confidence for 3, 76 degrees of freedom. The results reveal that due to the

above said training resting pulse rate reduced significantly.

The result of the study indicate that there is statistically significant differences among adjusted post-test mean of Plyometric training group, weight training group and control group on resting pulse rate.

Therefore, it was concluded that there is significant difference among the adjusted post-test men of Plyometric training group, weight training group and control group on resting pulse rate.

To determine which of the paired mean had significant difference, the Scheffe's test was used as post-hoc test and the results are presented in the below table-2.

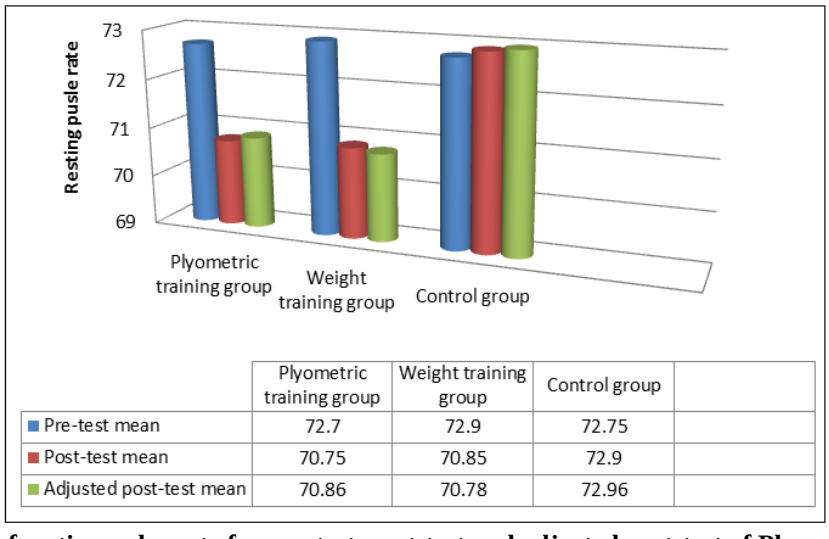
Table-2: The Scheffe's Test for the Differences between Paired Mean of Groups on Resting Pulse Rate

Plyometric Training	Weight Training	Control Group	Mean Differences	CI
70.86	70.78		0.07	
-	70.78		0.64*	
	70.78	72.96	2.18*	
70.86			0.72*	
70.86		72.96	2.10*	0.4100
		72.96	2.82*	

*Significant at 0.05 level

The multiple mean comparison in the above table proves that there existed significant difference between the adjusted mean of the all the treatment groups. The plyometric training group and weight training group had similar decline in resting pulse rate among male football players.

The pre-test, post-test and adjusted post test mean values of plyometric training group, weight training group and control groups on resting pulse rate are graphically presented in figure-1.



	Plyometric training group	Weight training group	Control group	
Pre-test mean	72.7	72.9	72.75	
Post-test mean	70.75	70.85	72.9	
Adjusted post-test mean	70.86	70.78	72.96	

Fig-1: Mean scores of resting pulse rate for pre-test, post-test and adjusted post-test of Plyometric training group, weight training group and Control group

DISCUSSION ON FINDINGS

From the result, it has been concluded that Plyometric training group and weight training group has reduced on resting pulse rate when compared with control group. It was investigated and concluded that resting pulse rate of experimental group reduce significantly when compared with control group.

In the beginning of the study, it was hypothesized that effect of plyometric training group and weight group training on selected physiological variable namely resting pulse rate, would be significantly differ when compared to the control group. The result reveals that there is a significant change on physiological variable due to the plyometric training, weight training when compared to the control group. Therefore, hypothesis has been accepted. So, null hypothesis was rejected at 0.05 level of confidence. The study fall in the line of Singh L. Santosh *et al*., conducted a Study of training on physiological variables of Football players, the study has found significant improvement of physiological variables i.e.

resting heart rate and vital capacity [5]. Thapa, Sumit Kr. also conducted a experimental study entitled "effect of 15days Adventure sports programme on resting pulse rate and vital capacity" [6], found significant improvement; From the various studies, it is conducted that plyometric training and weight training programme has positive effect on physiological variables of players.

CONCLUSIONS

Considering the limitation of the study it is concluded that Resting pulse rate is significantly improved by the plyometric training group and weight training group when compared with control group and also found significant improvement by the plyometric training group when compared with weight training group.

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