ISSN: 2349 - 4891

International
Journal of Recent Research and Applied Studies
(Multidisciplinary Open Access Refereed e-Journal)

Effect of Twelve Weeks Plyometric Training Programme on Selected Lung Parametres among Women Football Players

Dr.S.Varalakshmy

Director of Physical Education, Thiruvalluvar University College of Arts & Science, Thiruvennainallur, Villupuram, Tamilnadu, India.

Received 22nd January 2016, Accepted 1st March 2016

Abstract

The purpose of the study was to investigate the effect of plyometric training on selected lung parameters variables among football players. It was hypothesized that there would have been a significant effect of plyometric training on selected lung parameters variables among football players. For the present study 30 women University football players from Thiruvalluvar University, Vellore, Tamilnadu were selected at random and their age ranged from 18 to 21 years. The subjects were randomly assigned to two equal groups of fifteen each and named as Group 'A' and Group 'B'. Group 'A' underwent plyometric training and Group 'B' underwent no training. The variables such as vital capacity, slow vital capacity and fast vital capacity were assessed by spirometer. The data was collected before and after twelve weeks of training and analyzed by applying Analysis of Co-Variance (ANCOVA). The level of significance was set at 0.05. Significant effect of plyometric training was found on vital capacity, slow vital capacity and fast vital capacity.

Keywords: Vital Capacity, Spirometer, Football, Plyometric.

Introduction

Plyometrics enable a muscle to reach maximal force in the shortest possible amount of time. Plyometrics can be characterized by "quick, powerful movements using a pre-stretch or countermovement that involves the stretch-shortening cycle". Such exercises include bounding, box jumps, depth jumps, standing and multiple jumps, and hops. The stretch shortening cycle involves three phases eccentric contraction, amortization, and concentric contraction phases. The eccentric phase involves stretch of the agonist muscle group, while the concentric phase involves rapid shortening contraction of the same muscle group. Amortization, however, is the brief transition between the eccentric and concentric phases. The reason for performing plyometric exercises is to increase the power of subsequent movements, which is accomplished through the use of both the natural elastic components of a muscle and tendon and through the stretch reflex. A rapid eccentric muscle action stimulates the stretch reflex and the storage of elastic energy, which in turn increases the force produced during the subsequent concentric action. This is why the amortization phase must be as short as possible because if it is not, the stretch reflex will not respond and all of the stored elastic energy will be lost as heat. (Chu, 1992).

Football is a game of physical and mental challenges. Football players must execute skilled movements under generalized conditions of restricted space, limited time, physical and mental fatigue, and opposing players. One must be able to run many miles during a game, mostly at sprint like speed and respond quickly to a variety of rapidly changing situations during play. Finally, one need a thorough understanding of an individual, group and team tactics. One's ability to meet all these challenges determines how well one performs on the football field. (Reily, 1996).

Correspondence
Dr. S. Varalakshmy
E-mail: varalakshmy10@gmail.com, Ph. +9199629 46362

Methodology

The purpose of the study was to investigate the effect of plyometric training on selected lung parameters variables among football players. It was hypothesized that there would have been a significant effect of plyometric training on selected lung parameters variables among football players. For the present study 30 women University football players from Thiruvalluvar University, Vellore, Tamilnadu were selected at random and their age ranged from 18 to 21 years. The subjects were randomly assigned to two equal groups of fifteen each and named as Group 'A' and Group 'B'. Group 'A' underwent plyometric training and Group 'B' underwent no training. The variables such as vital capacity, slow vital capacity and fast vital capacity were assessed by spirometer. The data was collected before and after twelve weeks of training and analyzed by applying Analysis of Co-Variance (ANCOVA). The level of significance was set at 0.05.

Results

The findings pertaining to analysis of co-variance between experimental group and control group on selected lung parameters variables among football players for pre-post test respectively have been presented in table I to III.

Table I. ANCOVA between Experimental Group and Control Group on Vital capacity of Football Players for Pre, Post and Adjusted Test

	Experimental Group	Control Group	Source of Variance	Sum of Squares	df	Mean Square	F
Pre Test Mean	2.85	2.82	BG	229.73	1	229.73	0.86
			WG	7462.66	28	266.52	
Post Test Mean	3.41	2.83	BG	2151.53	1	2151.5	5.18*
			WG	11615.33	28	414.83	
Adjusted Post Mean	3.41	2.84	BG	2516.92	1	2516.92	6.23*
			WG	10900.16	27	403.70	

*** Significant at 0.05 level.** **df: 1/27= 4.21**

Table I revealed that the obtained 'F' value of 6.20 was found to be significant at 0.05 level with df 1, 27 as the tabulated value of 4.21 required to be significant at 0.05 level. The same table indicated that there was a significant difference in adjusted means of vital capacity of football players between experimental group and control group. The graphical representation of data has been presented in figure I.

Figure I. Comparisons of Pre – Test Means Post – Test Means and Adjusted Post – Test Means for Control group and Experimental Group in relation to vital capacity

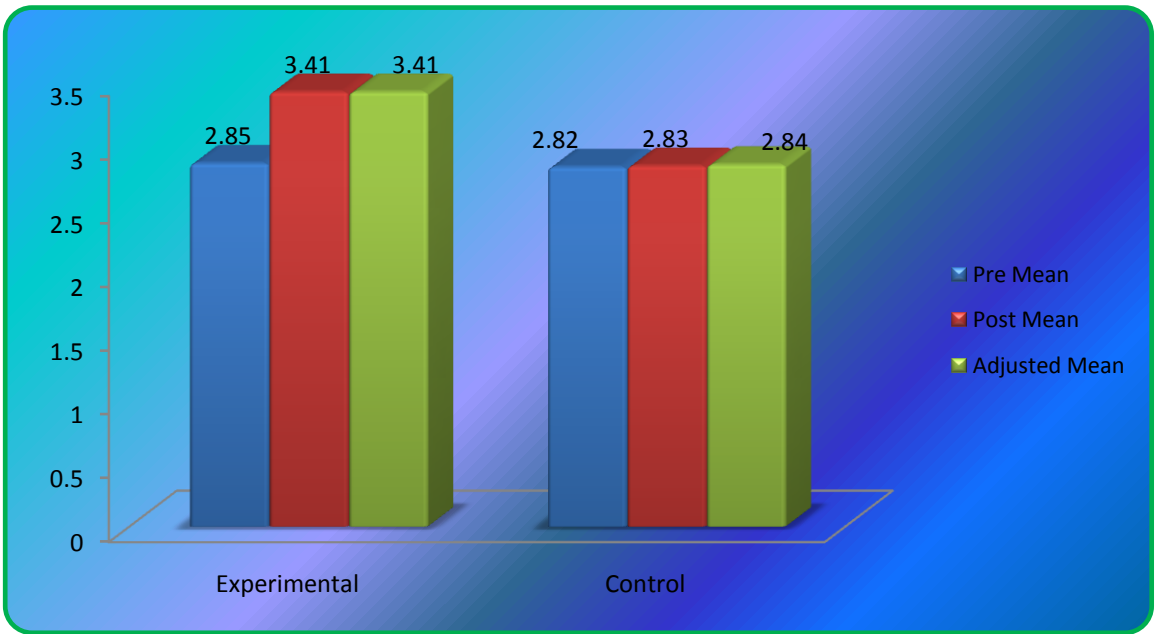


Table II. ANCOVA between Experimental Group and Control Group on slow vital capacity of Football Players for Pre, Post and Adjusted Test

	Experimental Group	Control Group	Source of Variance	Sum of Squares	df	Mean Square	F
Pre Test Mean	3.63	3.72	BG	67.54	1	67.54	1.06
			WG	1773.86	28	63.35	
Post Test Mean	4.33	3.73	BG	3740.87	1	3740.87	71.93*
			WG	1456.13	28	52.00	
Adjusted Post Mean	4.36	3.72	BG	3498.80	1	3488.80	65.40*
			WG	1440.28	27	53.34	

*** Significant at 0.05 level.** **df: 1/27= 4.21**

Table II revealed that the obtained 'F' value of 65.40 was found to be significant at 0.05 level with df 1, 27 as the tabulated value of 4.21 required to be significant at 0.05 level. The same table indicated that there was a significant difference in adjusted means of slow vital capacity of football players between experimental group and control group. The graphical representation of data has been presented in figure II.

Figure II. Comparisons of Pre – Test Means Post – Test Means and Adjusted Post – Test Means for Control group and Experimental Group in relation to slow vital capacity

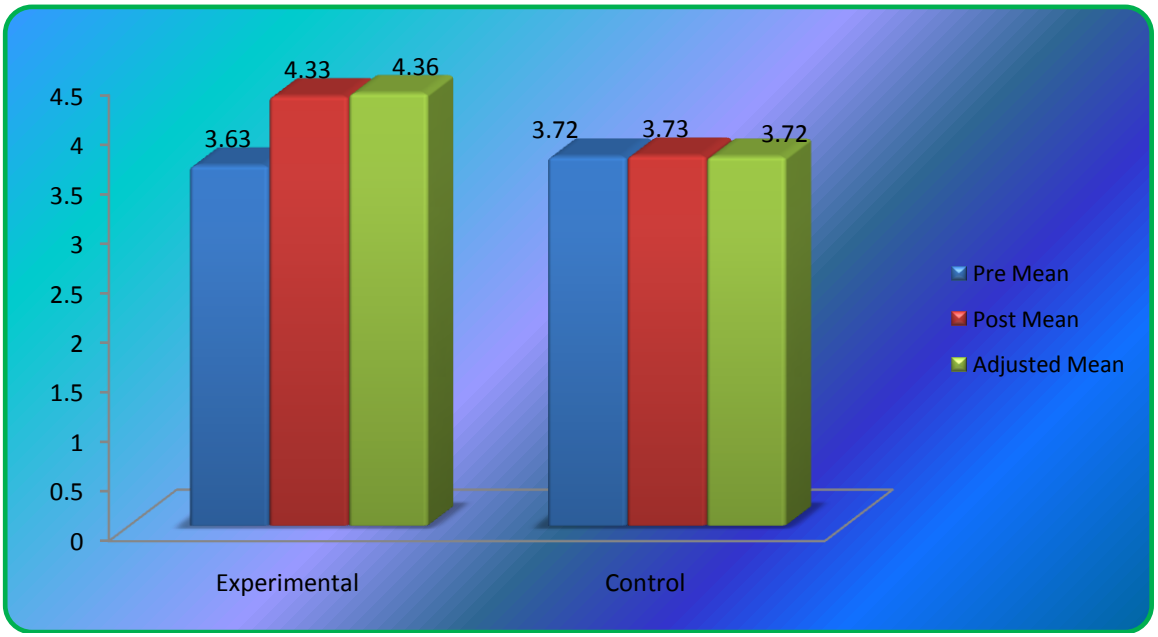


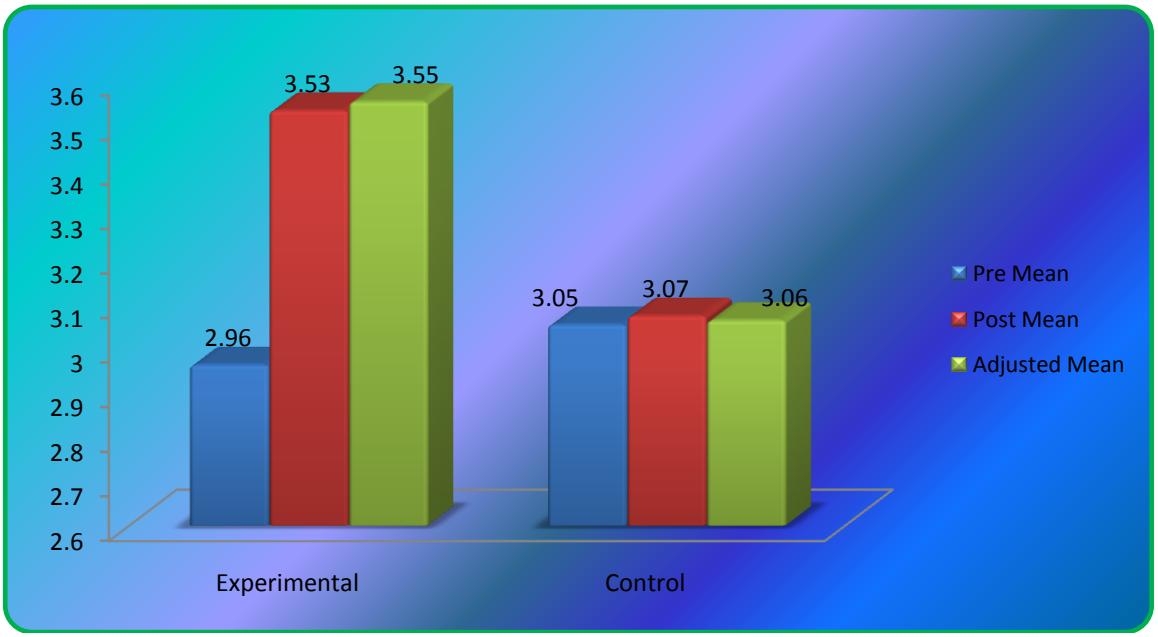
Table III. ANCOVA between Experimental Group and Control Group on fast vital capacity of Football Players for Pre, Post and Adjusted Test

	Experimental Group	Control Group	Source of Variance	Sum of Squares	df	Mean Square	F
Pre Test Mean	2.96	3.05	BG	2.77	1	2.77	0.21
			WG	359.60	28	12.84	
Post Test Mean	3.53	3.07	BG	740.11	1	740.11	25.70*
			WG	806.13	28	28.79	
Adjusted Post Mean	3.55	3.06	BG	715.12	1	715.12	24.79*
			WG	778.90	27	28.84*	

*** Significant at 0.05 level.** **d/f: 1/27= 4.21**

Table III revealed that the obtained 'F' value of 24.18 was found to be significant at 0.05 level with df 1, 27 as the tabulated value of 4.21 required to be significant at 0.05 level. The same table indicated that there was a significant difference in adjusted means of fast vital capacity of football players between experimental group and control group. The graphical representation of data has been presented in figure III.

Figure III. Comparisons of Pre – Test Means Post – Test Means and Adjusted Post – Test Means for Control group and Experimental Group in relation to fast vital capacity



In case of lung parameters variables i.e. vital capacity, slow vital capacity and fast vital capacity the results between pre and post (12 weeks) test has been found significantly higher in experimental group in comparison to control group. This is possible because still they are under process of physical and physiological growth and development which directly contribute to enhancement in their vital capacity, slow vital capacity and fast vital capacity and due to regular training programme of plyometric which may also bring sudden spurt in lung parameters variables in football players.

The findings of the present study have strongly indicates that plyometric training of twelve weeks have significant effect on selected lung parameters variables i.e., vital capacity, slow vital capacity and fast vital capacity of football players. Hence the hypothesis earlier set that plyometric training programme would have been significant effect on selected lung parameters variables in light of the same the hypothesis was accepted.

Conclusions

On the basis of findings and within the limitations of the study the following conclusions were drawn: Significant effect of plyometric training was found on vital capacity, slow vital capacity and fast vital capacity.

References

1. Barrow, M. H., McGhee, R. (1979). *A practical approach to measurement in physical education***.** Philadelphia: Lea and Febiger, Edition-3rd.
2. Bucher, C. A. (n.d.). *Foundation of physical education and sports*. Publisher Mc Graw-Hill, 13th Edtion, pp.222-223.
3. Karfs, C. E., Aruheim, D. D. (1969). *Modern principles of athletes training*. St. Louis's Mosby Company, p. 117.
4. Mohan, R. (2003). *Research methods in education*. New Delhi: Neelkamal Publications Pvt. Ltd.
5. Neilson, N. P., Johnson, C. R. (1970). *Measurement and statistics in physical education.* Belmont California: Warsworth Publishing Company Inc., p.245.
6. Polman, R., Walsh, D., Bloomfield, J., & Nesti, M. (2004). Effective conditioning of female soccer players. *Journal of Sports Sciences, 22*(2), 191-203.
7. Singh, H. (1993). *Science of sports training.* New Delhi: D.V.S. Publications, p.175.
8. Srivastva, G. (1994). *Advanced research methodology*. New Delhi: Radha Publications.