ISSN: 2349 - 4891

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

Effect of Plyometric Exercises on Leg Strength and Abdominal Strength of High School Volleyball Players

K. Muthyalaiah Chetty[1] & Dr. K. Vaithianathan[2]

[1]*Research Scholar, Department of Physical Education, TNPESU, Chennai, Tamilnadu, India.*
[2]*Vice-Chancellor (Rtd.), TNPESU, Chennai, Tamilnadu, India.*

Received 25th February 2016, Accepted 15th April 2016

Abstract

The purpose of the study was to find out the effect of plyometric exercises on leg strength and abdominal strength of high school Volley Ball players. To achieve the purpose of these studies thirty boys Volley Ball players from Govt. High School, Chandragiri. The subjects were in the age group of 14 to 17year. The subjects were given training programme for three days per week for six weeks. In this study the investigator measured leg strength (half squad) and abdominal strength (sit ups). After the plyometric exercises for six weeks, the subjects were measured of their performance in leg strength and abdominal strength. The difference between the initial and final scores was the effect of plyometric exercises. The obtained data were subjected to statistical treatment using 't' ratio test. The results of the study proved that there was significant improvement in selected physical and physiological variables of high school Volley Ball players due to plyometric exercises.

Keywords: Plyometric Exercises, Volleyball, School Boys, Leg Strength, Abdominal Strength.

Introduction

Physical fitness is probably the most popular and frequently used term in physical education. The most important objective of physical educators is to develop physical fitness. According to Nixon and cozens, it was the desire to establish a scientific approach to the development of physical fitness which formed the basis of the first meeting of physical educators in 1885 when the profession of physical education originated. Volleyball is played in more than sixty countries and more than sixty million people. In Eastern Europe, Asia and South America top games draws crowds, the size of which rival those at soccer matches. Volleyball is considered as a top level competitive sport in more than twenty countries. The game of Volleyball was invented in 1895 by William G Morgan who worked for the Y.M.C.A in Holyoak, Massachusetts. His early form of the game was designed to provide mild exercise for large groups of businessmen. This original game was very simple any number of players batted a basketball bladder backward and forward over a tennis net which was fixed at a height of six feet. Since then the game has developed and spread worldwide. The main reason of its popularity was it can be played indoors and outdoors, need little space compared to other games, and it can be played by both sexes and over a considerable age range.

Correspondence
K.Muthyalaiah Chetty
E-mail: vishnusports@gmail.com, Ph. +9198851 25771

Play can be tremendously varying standards from a purely recreations level on the beach and in the park, through all levels of clubs and school level competitions, right up to international level.

Plyometric also known as "plyos" is a type of exercise training designed to produce fast, powerful movements, and improve the functions of the nervous system, generally for the purpose of improving performance in sports. Plyometric exercises may also be referred to as explosive exercises. Plyometric movements, in which a muscle is loaded and then contracted in rapid sequence, use the strength, elasticity and innervations of muscle and surrounding tissues to jump higher, run faster, throw farther, or hit harder, depending on the desired training goal. Plyometric is used to increase the speed or force of muscular contractions, providing explosiveness for a variety of sport specific activities. Plyometric has been shown across the literature to be beneficial to a variety of athletes. Benefits range from injury prevention, power development and sprint performance amongst others

Methodology

The subjects were selected from Govt. High School Chandragiri the age group of the subjects was between 14-17 years. Thirty subjects were selected at random and subjects were divided into two equal groups - one Experimental Group and the other Control Group. Thus each group consisted of 15 subjects. Each subject was oriented in the procedure to the administration of the test. All the subjects were tested on the selected physical

variables.

Table I. Criterion Measures

S.No	Physical Variables	Test items	Unit of Measurement
1	Leg Strength	Half Squat	Seconds
2	Abdominal Strength	Sit-Ups	Counts

Statistical Technique

The researcher used t-ratio to find the significant difference between the means of pre-test and post-test of all the selected variables. According to Clarke t-ratio is the ratio of difference between means and the standard error of the difference.

Analysis and Interpretation of Data

The purpose of this study was to find out the effect of plyometric exercises on leg strength and abdominal strength of High School Volley Ball players. The statistical analysis of data collected from the experimental and control groups are presented in this chapter. On the basis of the statistical analysis result are discussed. The mean difference between the pre and post test of the control and experimental groups was tested using‘t’ ratio to find out significance of the difference made by the experimental and control groups during the experimental period of six weeks. The mean difference between the experimental and control group after six weeks of training was tested by ‘t’ ratio and determined the significance of the difference.

Table II. Analysis of T-ratio on Pre and Post-test for Control and Experimental Group on Leg Strength

Variables	Group	Mean		SD		SD Error	df	‘t’ ratio
		Pre	Post	Pre	Post			
Leg Strength	Control	1.47	1.46	0.33	0.24	0.04	14	0.08
	Experimental	1.48	1.79	0.32	0.45	0.06		4.99*

****Significance at .05 level of confidence***

The Table II shows that the mean values of pre-test and post-test of control group on leg strength were 1.47 and 1.46 respectively. The obtained ‘t’ ratio was 0.08 since the obtained ‘t’ ratio was less than the required table value of 2.15 for the significant at 0.05 level with 14 degrees of freedom, it was found to be statistically insignificant. The mean values of pre-test and post-test of experimental groups in leg strength were 1.48 and 1.79 respectively. The obtained ‘t’ ratio was 4.99 since the obtained ‘t’ ratio was greater than the required table value of 2.15 for significance at 0.05 level with 14 degrees of freedom it was found to be statistically significant.

Table III. Analysis of T-ratio on Pre and Post-test for Control and Experimental Group on Abdominal Strength

Variables	Group	Mean		SD		SD Error	df	‘t’ ratio
		Pre	Post	Pre	Post			
Abdominal Strength	Control	26.66	26.60	2.58	2.92	0.24	14	0.26
	Experimental	26.66	27.60	3.95	3.79	0.20		4.52*

Significance at .05 level of confidence

The Table III shows that the mean values of pre-test and post-test of control group on abdominal strength were 26.66 and 26.60 respectively. The obtained ‘t’ ratio was 0.26 since the obtained ‘t’ ratio was less than the required table value of 2.15for the significant at 0.05 level with 14 degrees of freedom, it was found to be statistically insignificant. The mean values of pre-test and post-test of experimental groups in abdominal strength were 26.66 and 27.60 respectively. The obtained ‘t’ ratio was 4.52 since the obtained ‘t’ ratio was greater than the required table value of 2.15 for significance at 0.05 level with 14 degrees of freedom it was found to be statistically significant.

Conclusions

It was hypothesized that there would be

significant improvement on in leg strength and abdominal strength due to plyometric exercises. The present study result show significant improvement selected variables. Hence the due to plyometric exercises research hypothesis of the investigator was accepted. It was concluded that there was a significant improvement in leg strength and abdominal strength of high school volleyball players due to plyometric exercises.

References

1. Adams TM., (1984) "An investigation of selected plyometric training exercises on muscular leg strength and power" Track field Quarterly Review; 84-36.
2. Astrand, P. and Kaaxe R., (1977), Text Book of Work Physiology, New York: McGraw Hill Book Company, P. 27.
3. Singh, Hardayal.,(1991) Science of Sports Training. New Delhi DVS .Publications.
4. Vescovi et.al. (2008) "Effects of a plyometric program on vertical landing force and jumping performance in college women" Journal of physiology sport, 9(4): 185-92.
5. Villarreal and gonzale z., (2008), "Low and moderate plyometric training frequency produced greater jumping and sprinting games compared with high frequency", Journal of strength condition research, 22-3,715-725.