



Effect of plyometric training on vertical jumping ability among college men volleyball players

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Abstract

The present study was to determine the effect of plyometric training on vertical jumping ability of college men volleyball players. Twenty male students ($n = 20$) were randomly selected as subjects and the age were ranged between 18 and 24 years. The selected subjects were randomly assigned into two equal groups such as training group (TG) and the control group (CG) for the strengths of ten ($n = 10$) each. Experimental training group underwent respective plyometric training programme for twelve weeks for three days per week and a session on each day. The control group did not involve in any special training apart from their regular activities. The vertical jumping ability was taken as a criterion variable for the present study and it was measured by standing vertical jump. Analysis of covariance (ANCOVA) was used to analyse the collected data. The results revealed that the plyometric training was made significant improvement ($p \leq 0.05$) in jumping ability of the selected subjects. The level of confidence was fixed at 0.05 in all cases.

Keywords: plyometric training, vertical jumping, volleyball players

Introduction

Plyometric training comes from the Greek word plyometrics which means more "length". This length refer's to the body's muscle for enhanced performance and powerful movements. Plyometric training includes the movements which aim to strengthen the muscles and thereafter contracting it in rapid progression. Plyometric training is the key to develop maximal explosive power and speed movement which in turn are the elements in sports too. By doing various exercises one can increase the performance level greatly (Hatfield, 1986)^[7]. Plyometric training is a specific work for the enhancement of explosive power. It is a training method to be used in conjunction with other power development methods in a complete training programme to improve the relationship between maximal strength and explosive power. Plyometrics refers to the exercises that enable a muscle to reach maximal strength in as short a time as possible (Baechle, 1994)^[1].

The vertical jump test is a common fitness test of leg power. The standing vertical jump is a popular test of a leg power and it is routinely used to monitor the effectiveness of an athlete's conditioning program. Vertical jump ability is critical for success in volleyball. Jumping is utilized during the jump set, jump serve, blocking and spiking. A successful player must not only be able to jump high but must also be able that height quickly. This requires an ability to generate power in a very short time. It is a measure of the elastic strength in jumping vertically and making a mark in the board where the reaching height is recorded.

Materials and Methods

The present study was to determine the effect of plyometric training on vertical jumping ability of college men volleyball players. Twenty male students ($n = 20$) were randomly selected as subjects for this study from the Department of Physical Education at Annamalia University, Tamil Nadu. The age was ranged between 18 and 24 years. The selected subjects were randomly assigned into two equal groups such as training group (TG) and the control group (CG) for the strengths of ten ($n = 10$) each. Experimental training group underwent respective plyometric training programme for twelve weeks three days in a week and a session on each day. All the subjects were present for more than 90% of the total training sessions. The control group did not involve in any special training apart from their regular activities. The vertical jumping ability was taken as a criterion variable for the present study and it was measured by standing vertical jump. The moderate intensity has given to the training group (60-70%). The plyometric training such as tuck jump with knees up, standing jump over barrier, double leg hops, lateral step up, depth jump and single leg bounding. The collected data were statistically examined by analysis of covariance (ANCOVA). The confidence level was fixed at 0.05 levels, which is appropriate to the present study.

Data Analysis

Mean and Standard deviation were calculated for vertical jumping ability of each training group. And the data were

analyzed by using analysis of covariance (ANCOVA).

Statistical significance was fixed at 0.05 levels.

Results and Discussion

Table 1: Analysis of Covariance on Vertical Jumping Ability between the Training Group and the Control Group

Test		Training Group	Control Group	SOV	SS	df	MS	F
Pre test	Mean	25.70	25.40	B	0.45	1	0.45	0.19
	SD	1.70	1.34	W	42.5	18	2.36	
Post test	Mean	31.90	26.60	B	140.4	1	140.4	17.16*
	SD	3.69	1.64	W	147.3	18	8.13	
Adjusted Post test	Mean	31.86	26.63	B	135.1	1	135.19	15.87*
				W	144.81	17	8.51	

*Significant at 0.05 level of confidence

(The table value required for significance at 0.05 level of confidence with df 1 & 18 and 1 & 17 are 4.41 and 4.45 respectively)

The analysis of covariance on vertical jumping ability among experimental and control group were described in table no I. The mean value of vertical jumping ability of training and control groups were 25.70 and 25.40. The obtained 'F' value of 0.19 was lesser than the table value of 4.41, there was insignificant among the groups in pre test result of vertical jumping ability. The post test means of the groups were 31.90 and 26.60 respectively, and the obtained 'F' value of 17.16 was greater than the table value, and there was a significant difference in vertical jumping ability between the training and control groups in vertical jumping ability among the male college volleyball players. The obtained adjusted post test F value also greater the table value of 4.45 for df 1 and 17 required for significant at 0.05 level. The pre, post and the adjusted post test mean values of the experimental and control groups on vertical jumping ability were graphically represented in Figure I.

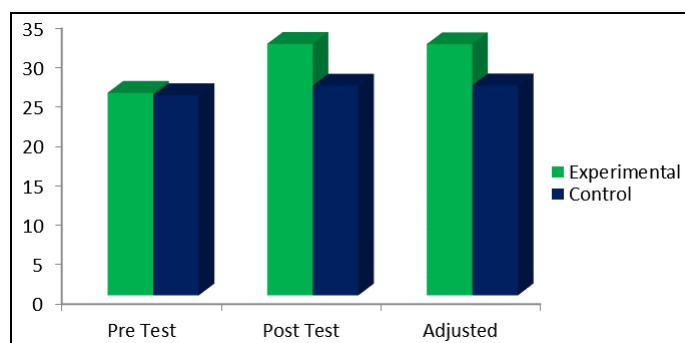


Fig 1: The pre, post and adjusted posttest mean values of experimental group and the control group on vertical jumping ability.

Discussion

The result of the present study pointed out that there was a significant difference in vital capacity due to twelve weeks of plyometric training. The current study also utilized 8 weeks programme duration with three sessions per week and found that vertical jumping ability increases due to plyometric training. The findings are also in agreement with the findings of Brown (1986) [2] that plyometric exercises improve the vertical jumping ability. Thorgterson (1976) [6] and Abraham (2011) [4] concluded that strength training improves the

performance of standing vertical jump. McNeal (1998) [5] and Christou (2006) recommended that resistance training is more ideal to improve jumping ability. Several studies suggested that plyometric training is very valuable for determining the variables such as explosive power Campo (2009) [3] Andrew (2010). From the results of the present study and literature, it is concluded that dependent variable such as vertical jumping ability was significantly improved due to the plyometric training.

Conclusion

The result of the study revealed that the training group has significant improvement in vertical jumping ability among college male volleyball players after the plyometric training protocol. It was also concluded that the plyometric training is one of the best training methods for improving the vertical jumping ability as well as the physical fitness of young men.

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