

EFFECT OF PLYOMETRIC TRAINING ON LOWER EXTREMITY STRENGTH OF SCHOOL VOLLEYBALL PLAYERS

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Abstract

The objective of the present study was to find out the "Effect of Plyometric Training on the Lower Extremity Strength of School Volleyball Players". The Plyometric exercises would help significantly to improve explosive strength of legs was the hypothesis framed in the light of objective of present study. A single-group pre-post test experimental design was employed, with 30 (n=30) participants aged 14-17 selected from a district-level volleyball competition using purposive sampling. To find out the effect of Plyometric training on lower extremity strength, the subject was given training for 3 days a week for 12 weeks. Pre- and post-tests of vertical jump (VJ) and standing broad jump (SBJ) were taken. Statistical method of "t" test was applied to test the hypothesis taken for the present study. The results showed that a 12-week training program significantly improved the Lower Extremity Strength between pre- and post-test scores. It indicated a significant improvement between pre-post test mean difference ($t = 3.33, p < 0.05$) in vertical jump (VJ) and a significant improvement between pre-post test mean difference ($t = 2.68, p < 0.05$) in standing broad jump (SBJ) performances after the Plyometric training. The findings suggest that three days of Plyometric training in a week for 12 weeks is sufficient to show improvement in Lower Extremity Strength, and it is an effective method for improving lower extremity power in school volleyball players.

INTRODUCTION:

Physical fitness is important to improve health, a more attractive appearance, and increased physical performance. More recently, physical fitness has been conceptualised as a manifested continuum extending from birth and death and has been operationally defined by tests to measure it. (AAPHERD, 1980) Volleyball is the most popular team sport, extensively played and

viewed in most countries in the world. Volleyball has developed to involve common techniques of defensive and offensive structures. This is the sport that requires quick movements, explosive power, and jumping ability. Plyometric training is a type of exercise that involves rapid, high-intensity movements and has been

shown to improve power and jumping ability in athletes. The purpose of this study was to investigate the effect of Plyometric training on the lower extremities of school volleyball players.

Objectives of Study:

1. To investigate the effect of Plyometric training on the lower extremity of school volleyball players.
2. To examine the impact that Plyometric training increases the explosive strength of 14-17-year-old volleyball players

Hypothesis:

1. Plyometric training will significantly improve the lower extremities of school volleyball players.
2. Plyometric training will increase the explosive strength of 14-17-year-old volleyball players.

Research Design:

A single-group pre-post test experimental design was used for the study. 30 (n=30)volleyball players aged 14-17 selected from the Jalna District-Level Volleyball Competition by using purposeful sampling.

Procedure:

The training program consisted of (a) 10 min of warm-up exercises (b) 40 min of Plyometric exercises for lower extremity strength at an intensity of low to moderate level with 2 sets in 6–10 repetitions, (c) 20 min of dynamic stretching exercises (d) at the end of the session, 10 min of cool down exercise. The subject was trained 3 days in a week in the morning session.

Selection of Variables:

Dependent variables: Vertical Jump (VJ) and Standing Broad Jump. These are the two dependent variables selected for the present study.

Independent variables: Independent variables selected in this present study are;

1. Squat Jump
2. Single Leg Forward-
3. Backwards Jump
4. Box Jump
5. Depth Jump
6. Duck Jump
7. Depth Jump with single leg Hop
8. Tuck Jump Multi-directional Jump
9. Lateral Hop

10. Hurdles Hop

Tools of Data Collection:

Lower extremity strength was measured by using the Vertical Jump (VJ) Test and Standing Broad Jump (SBJ); the score was recorded in meters.

The above test was measured before and after 12 12-week training period.

Statistical Tools:

“t” test method was used to determine the significance of differences in the measured variable between pre-test and post-test. The result was presented as mean (SD) $p < 0.05$ was accepted as significant.

Result:

Table 1

Mean, Mean Difference, Standard Deviation and “t” Value between Pre- and Post-Test of Vertical Jump

Vertical Jump	Mean	Mean Difference	Std. Deviation	df	“t”
Pre Test	2.61	0.11	0.13	2	3.33
Post Test	2.72			9	

Significant at 0.05(29) = 2.045

The above table shows the results of Mean, Standard Deviation and Mean difference between pre- and post-test values of vertical jump (VJ) were 2.61 & 2.72, 0.13&0.13, 0.11, respectively. It indicates that there exists a significant mean difference between pre- and post-test of vertical jump (VJ), which was recorded as 0.11. When the “t” ratio was applied to find out the statistical difference between pre- and post-tests, the computed “t” value 3.33 was greater than the table value of 2.045 and thus the score of post post-test was significant at the 0.05 level of confidence.

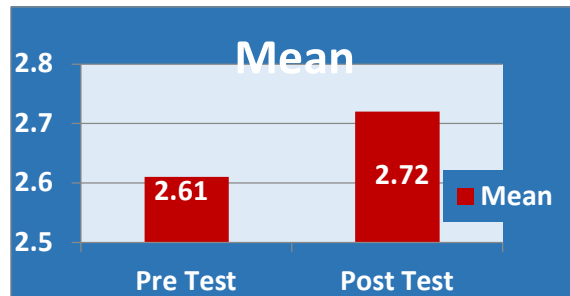
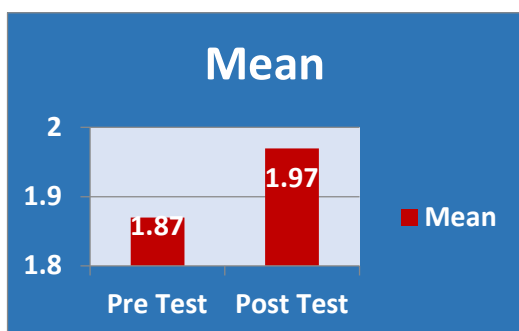


Table 2

Mean, Mean Difference, Standard Deviation and “t” Value between Pre- and Post-Test of Standing Broad Jump

Standing Broad Jump	Mean	Mean Difference	Std. Deviation	df	“t”
Pre Test	1.82	0.15	0.22	29	2.68
Post Test	1.97				

Significant at 0.05(29) = 2.045



The above table shows the results of Mean, Standard Deviation and Mean difference between pre- and post-test values of standing broad jump (SBJ) were 1.82 & 1.97, 0.22 & 0.15, respectively. It indicates that there exists a significant mean difference between pre- and post-test of the standing broad jump (SBJ) which was recorded as 0.15. When the “t”

CONCLUSION

1. Plyometric training has significantly improved the lower extremities of school volleyball players.
2. Plyometric training had increased the explosive strength of 14-17-year-old volleyball players.
3. These findings suggest that Plyometric training is an effective method for improving lower extremity power in school volleyball players.

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ratio was applied to find out the statistical difference between pre- and post-tests, the computed “t” value 2.68 was greater than the table value of 2.045 and thus the score of post post-test was significant at the 0.05 level of confidence.

Discussion:

The subjects selected for the present study were players of the school volleyball team in the Inter-District Tournament. They were purposively selected for the study. A total of subjects (n=30) were given Plyometric Training for 12 weeks. The mean value and standard deviation of pre-test and post-test of vertical jump (VJ) of the subject were 2.61 & 2.72, 0.13, respectively. When the statistical comparison of pre-test and post-test of vertical jump (VJ) was compared, the post-test was better than the pre-test of this group (“t” =3.33)

The findings regarding the mean value and standard deviation of pre-test and post-test of standing broad jump (SBJ) of the subject were 1.82 & 1.97, 0.22, respectively. When the statistical comparison of pre-test and post-test of standing broad jump (SBJ) was compared, the post-test was better than the pre-test of this group (“t” =2.68)

The Difference was statistically found significant at a 0.05 level of confidence (“t” = 3.33 and 2.68) for both vertical jump (VJ) and standing broad jump (SBJ), respectively is major.

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