International Journal of Sports, Exercise and Physical Education
www.sportsjournals.net
Online ISSN: 2664-729X; Print ISSN: 2664-7281; Impact Factor: RJIF 5.28
Received: 10-01-2020; Accepted: 29-01-2020; Published: 07-02-2020
Volume 2; Issue 1; 2020; Page No. 07-09

Effect of plyometric exercises on leg power Amonf the Kho-Kho players

SS Biju
Associated Professor, Head of Department, Department of Physical Educations, S.N College Chempazhanthy, Trivandrum, Kerala, India

Abstract
The aim of the study was to determine the effect of plyometric exercise on leg power. Sixty male Kho-Kho Players (N=60 were randomly selected as subjects and their age ranged between 17 and 25 years. The selected subjects were randomly assigned into two equal groups with thirty subjects each (N=30). Group I experimental, Group II Control group the experimental groups underwent their respective experimental treatment for twelve weeks 3 days per week and a session on each day. Control group was not exposed to any specific training apart from their curriculum. Leg power was taken as variable for this investigation. The pre and posttest were conducted one day before and after the experimental treatment. Analysis of covariance (ANCOVA) was used to analysis the collected data. Scheffe's test was used as a post hoc test to determine which of the paired mean differed significantly. The results revealed that There was also a significant difference between experimental groups on leg power ($P \leq 0.05$) Further it related that the plyometric training and plyometric training produced significant improvement ($P \leq 0.05$) on leg power as compared to control group.

Keywords: plyometric training, leg power

Introduction

Sport has been a part of civilized societies throughout history. In some cases, as in Greece in the fifth century B.C, sport was of central importance to culture and has been studied and analyzed by scholars on many disciplines over the past 50 years. Most scholars agree that sport is a manifestation of play and that sports are institutionalized forms of play. Sport involves ritual and it involves tradition.

The very elaborations of sport, its internal conventions of all kinds, its ceremonies, its endless meshes entangling itself for the purpose of training, testing and rewarding the rousing emotion within an individual to find a moment of freedom. Freedom is that state where energy and order merge and all complexity is purified into a simple coherence of parts and purpose and passions that cannot be surpassed and whose goal could only be to be itself.

Leg power is an essential component for success in sports and athletic performance. Therefore, the leg power measurement may help athletes, coaches, athletic trainers, and rehabilitation specialists in selecting, treating, and training athletes for a specific sport. Using a conventional 'jump and reach' test, one can accurately predict the leg power and success in anaerobic-type sports. Nineteen untrained male subjects performed 'jump and reach' vertical jumps on a force platform. Power values were calculated from the force versus time data obtained from the force platform.

Muscle power reflects the ability to generate muscular work per unit of time, and is more simply understood as the product of force and velocity (power = force × velocity). Though related to muscle strength, muscle power is a separate attribute declining more precipitously after age 50. Theoretically, muscle power may be related to mobility in many ways such as rapidly generating force to maintain balance following a perturbation or while performing a time-dependent task such as crossing a street before the light changes. Prior investigations have shown that impairments in muscle power are important factors limiting mobility in nursing home residents and in community-dwelling elders. These more recent studies evaluating both muscle power and strength impairments and their relation to important mobility tasks have suggested that muscle power may be a more critical attribute than strength. In one of these investigations, evidence suggested that, like strength, the relationship between muscle power and mobility performance is best characterized as curvilinear. A limitation of these investigations was that they were conducted in relatively small groups of subjects limiting the scope of the analyses and the generalizability of their results.

Methodology

For the purpose of this study, 60 Male Kho-Kho players who has played in the Senior state championships from different districts of Kerala were selected as the subjects. The age of the subjects ranged between 17 to 25 years. The subjects were informed about the nature of the study and their consent were also taken before involving them as subjects of the study. The subjects were later randomly assigned to a control group and to an experimental group of equal sizes. Sixty male Kho-Kho Players (N=60 were randomly selected as subjects and their age ranged between 17 and 25 years. The selected subjects were randomly assigned into four equal groups with thirty subjects each (N=30). Group I experimental, Group II Control group The experimental groups underwent their respective experimental treatment for twelve weeks 3 days per week and a session on each day. Control group was not exposed to any specific training apart from their curriculum. leg power was taken as variable for this investigation. The pre and posttest were conducted one day before and after the experimental treatment.

Result and Discussion

Table 1: Analysis of Co-Variance Done Among the Two Groups on Leg Power

	Control group	Experimental group	Source of Variance	Sum of Squares	df	Mean Squares	F-ratio	P-value
Pre-test Mean	2.647	2.774	Between	0.242	1	0.242	12.039	0.001
S.D.	0.154	0.128	Within	1.166	58	0.020		
Post-test Mean	2.673	3.017	Between	1.775	1	1.775	146.270**	0.000
S.D.	0.166	0.103	Within	0.704	58	0.012		P< .001
Adjusted Post-test Mean	2.711	2.978	Between	0.889	1	0.889	180.496**	0.000
S.D.	0.013	0.013	Within	0.281	57	0.005		P< .001

** significant at 0.01 level as the P-value is < 0.01

The Table 1 contains all the relevant factors related to analysis of co-variance done on the variable Leg Power. The post-test values are the values of the post-test variable Leg Power, while the pre-test variable is taken as the co-variate. The P-value of 0.001 associated with the pre-test scores indicates that, there is significant difference between the means of the pre scores of control and experimental group. Again, a P-value of 0.001 associated with the post scores implies that the post mean scores are also significantly different. Further, the said table do indicates an F-ratio of 180.496 on the adjusted post-test means and this do implies that, there existed mean differences on the variable Leg Power among the control and experimental group, as the P-value obtained has been 0.001 which is much less than 0.05, the level of significance set for this study.

Since, the F-ratio was found to be significant, the LSD post-hoc test was done, to find out whether there existed significant differences among the adjusted post-test means or not on the variable Leg Power and the details are presented in Table 2.

Table 2: LSD POST-HOC Test Done on the Two Groups for Difference Between Adjusted Post-Test Paired Means on Leg Power

Adjusted Post-test means		Mean Difference	Std. Error	P-value
Control group	Experimental group			
2.71	2.98	0.27*	0.020	P<.000**

* The mean difference is significant at 0.05 level

** Based on estimated marginal means.

Adjustment for multiple comparisons least significant difference (equivalent to no adjustment)

The above table do indicates a mean difference of 0.27 and a P-value of 0.000. This do clearly shows that, there existed significant differences in the adjusted post-hoc paired means among the control group and the experimental group. The graphical representation of the adjusted post-hoc means of the two groups are presented in Figure 1.

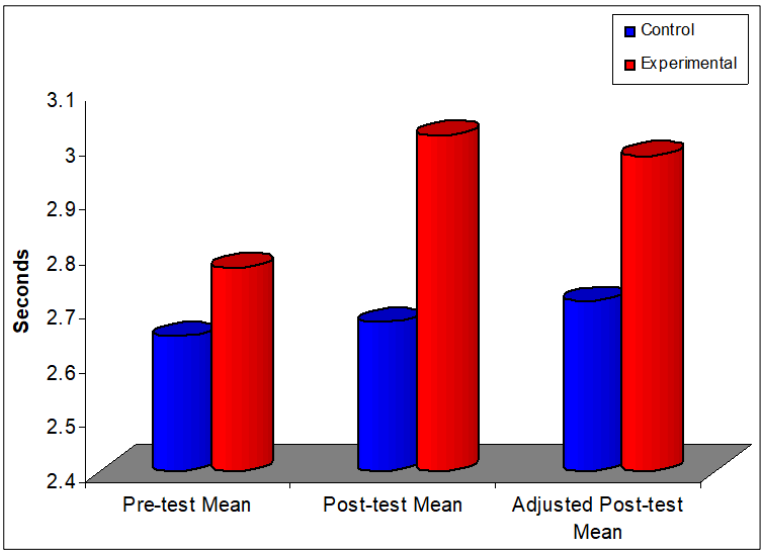

Fig 1: Graphical Representation of the Pre-test, Post-test and Adjusted Post-test Means on Leg Power of the two different groups

Conclusion

Significant difference was noticed among the two groups on Leg Power. This indicates that, the plyometric training programme does have had significant effect on the experimental group, so as for the improvement of Leg Power.

References

1. Arnhein Daniel D. Modern Principles of Athletic Training, St. Louis: The Mosby College Publishing Co, 1985.
2. Baechle Thomas R. (Ed.), Essential of Strength Training and Conditioning, Champaign, Illinois: Human Kinetics, 1994.
3. Hooks Gene. Application of Weight Training to Athletics, Engle Wood Cliffs: New Jersey, Prentice Hall. Inc, 1962.
4. Janner JM. The Physique of the Olympic, (London: The George Allen and Unwin Ltd, 1969.
5. Riley Daniel P. (Ed.), Strength Training (2nd Ed.), New York: Leisure Press, 1982.

6. Gehri Daniel J, *et al*., "A Comparison of Plyometric Training Techniques for Improving Vertical Jump Ability and Energy Production", Journal of Strength and Conditioning Research, 1998, 12(2).
7. Hisaeda, *et al*., "Influence of Two Different Modes of Resistance Training in Female Subjects", Ergonomics, 1996, 39(6).
8. Holcomb, William R, *et al*., "The Effectiveness of a Modified Plyometric Program on Power and Vertical Jump", Journal of Strength and Conditioning Research, 1996, 10(2).
9. Jones K, *et al*., "The Effect of Compensatory Acceleration on Upper Body Strength and Power", Journal of Strength and Conditioning Research, 1996, 10(1).
10. Kalyan Kumar Maji. "The Effect of Specific Isotonic, Isometric and Combination Training on Arm Strength", SAI-Scientific Journal, 1996, 19(4).
11. Kraemer WJ, Newton RV. "Training for Improved Vertical Jump", Sports Science Exchange, 1994, 7(6).
12. Human Athletic Performance", Mesomorphosis.com, 1998, 9.
13. Stevens WS. "A Comparison of the Effects of Depth Jumping and Regular Jumping on the Vertical Jump Performance of Male High School Students", Completed Research in Health, Physical Education, Recreation and Dance, 1992, 34.