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Effect of plyometric exercises on ankle flexibility among the kho-kho players

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Abstract

The aim of the study was to determine the effect of plyometric exercise on ankle flexibility. 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. Ankle flexibility was taken as variable for this investigation. The pre and post test 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 ankle flexibility ($P \leq 0.05$) Further it related that the plyometric training and plyometric training produced significant improvement ($P \leq 0.05$) on ankle flexibility as compared to control group.

Keywords: Plyometric training, ankle flexibility

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.

Muscle shortness and muscle contractures restrict the normal muscle action and are therefore considered as limiting factors for the range of motion. Performing stretching systematically could prevent such detrimental effects. Stretching can positively affect the everyday functional activities of an individual and narrow the risks for injury.

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.

Plyometrics is a method of developing explosive power, an important component of most athletic performances. As coaches and athletes have recognized the potential improvements which Plyometrics can bring about in performance, they have integrated it into the overall training programme in many sports and made it a significant factor in planning the scope of athletic development. Plyometrics is a new form of isotonic training which became popular during the late 1970s and early 1980s. Proposed to bridge the gap between speed and strength, plyometrics uses the stretch reflex to facilitate the recruitment of additional motor units and loads both the elastic and contractile components of muscle and hence, plyometrics has been referred to as bounce loading or rebound jumping.

The word Plyometrics is derived from the Greek word *pleythyein* meaning "to increase" or from the Greek roots *plio* and *metric* meaning 'More' and 'Means'. Plyometrics refers to exercises that enable a muscle to reach maximal strength in as shorter time as possible. Plyometrics exercises are important in sports requiring high levels of speed strength

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(Ability to exert maximum force during high speed activity) to complete movement such as sprinting, jumping and throwing.

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. Ankle flexibility was taken as variable for this investigation. The pre and post test 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 ankle flexibility

	Control group	Experimental group	Source of Variance	Sum of Squares	df	Mean Squares	F-ratio	P-value
Pre-test Mean	82.900	83.567	Between	6.667	1	6.667	0.302	0.585
S.D.	4.404	4.974	Within	1280.067	58	22.070		
Post-test Mean	83.233	87.633	Between	290.400	1	290.400	16.838**	0.000
S.D.	4.207	4.098	Within	1000.333	58	17.247		
Adjusted Post-test Mean	83.511	87.356	Between	220.595	1	220.595	111.557**	0.000
S.D.	0.257	0.257	Within	112.712	57	1.977		

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

The Table 28 contains all the relevant factors related to analysis of co-variance done on the variable Ankle Flexibility. The post-test values are the values of the variable Ankle Flexibility, while the pre-test variable was taken as the co-variate. The P-value of 0.585 associated with the pre-test scores indicates that, there is no significant difference between the mean 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 significantly different. Further, the said table do indicates an

F-ratio of 111.557 on the adjusted post-test means and this do implies that, there existed mean differences on the variable Ankle Flexibility between 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 Ankle Flexibility 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 ankle flexibility

Adjusted Post-test means		Mean Difference	Std. Error	P-value
Control group	Experimental group			
83.51	87.36	3.85*	0.364	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 3.85 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 experimental group. The graphical representation of the adjusted post-hoc means of the two groups are presented in Figure 1.

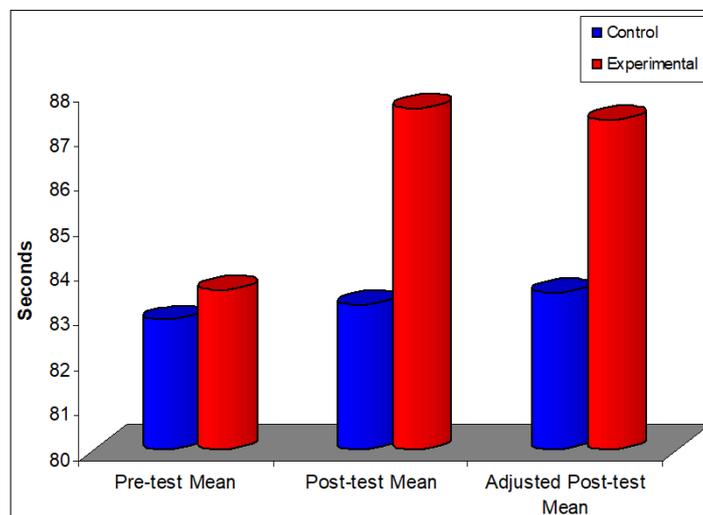


Fig 1: Graphical representation of the pre-test, post-test and adjusted post-test means on ankle flexibility of the two different groups

Conclusion

There was significant difference on Ankle Flexibility between the control group and the experimental group, as there was significant training effect on Ankle Flexibility of the experimental group after the plyometric training programme.

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