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## **Effect of plyometric exercises on coordination Among the Kho-Kho players**

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### **Abstract**

The aim of the study was to determine the effect of plyometric exercise on coordination. 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. Coordination 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 analyze 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 coordination ( $P \leq 0.05$ ). Further it related that the plyometric training and plyometric training produced significant improvement ( $P \leq 0.05$ ) on coordination as compared to control group.

**Keywords:** plyometric training, coordination

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### **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.

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 (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 had 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 was 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. Coordination 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 Coordination

	Control group	Experimental group	Source of Variance	Sum of Squares	df	Mean Squares	F-ratio	P-value
Pre-test Mean	1.982	1.901	Between	0.099	1	0.099	3.049	0.086
S.D.	0.225	0.120	Within	1.888	58	0.033		
Post-test Mean	2.021	1.940	Between	0.098	1	0.098	3.831	0.055
S.D.	0.201	0.104	Within	1.490	58	0.026		
Adjusted Post-test Mean	1.989	1.971	Between	0.005	1	0.005	0.742	0.393
S.D.	0.015	0.015	Within	0.379	57	0.007		

The Table 32 contains all the relevant factors related to analysis of co-variance done on the variable Coordination. The post-test values are the values of the post-test variable Coordination, while, the pre-test variable was taken as the co-variate. The P-value of 0.086 associated with the pre-test scores indicates that, there existed no significant difference among the means of the pre scores of control and experimental group. Again, a P-value of

0.055 associated with the post scores implies that the post mean scores are not significantly different. Further, the said table do indicates an F-ratio of 0.742 on the adjusted post-test means and this do implies that there existed no significant mean difference on the variable Coordination among the control and experimental groups, as the P-value obtained has been 0.393 which is greater than 0.05 the level of significance set for this study.

**Table 2:** Analysis of Co-Variance Done among the Two Groups on Endurance

	Control group	Experimental group	Source of Variance	Sum of Squares	df	Mean Squares	F-ratio	P-value
Pre-test Mean	2011.167	2012.500	Between	26.667	1	26.667	0.000	0.982
S.D.	233.370	233.145	Within	3155721.7	58	54408.994		
Post-test Mean	2017.667	2070	Between	41081.667	1	41081.667	0.933	0.338
S.D.	223.652	194.931	Within	2552536.7	58	44009.253		
Adjusted Post-test Mean	2018.257	2069.410	Between	39249.107	1	39249.107	28.143**	0.000
S.D.	6.818	6.818	Within	79492.770	57	1394.610		

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

The Table 33 contains all the relevant factors related to analysis of co-variance done on the variable Endurance. The post-test values are the values of the variable Endurance, while the pre-test variable was taken as the co-variate. The P-value 0.982 associated with the pre-test scores do indicates that, there is no significant difference between the mean of the pre scores of control and experimental group. Again, a P-value of 0.338 associated with the post scores implies that the post mean scores are significantly indifferent. Further, the said table do indicates an F-ratio of 28.143 on the adjusted post-test means and this do implies that there existed significant mean difference on the variable Endurance among the control group 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 Endurance and the details are presented in Table 3.

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.

**Table 3:** LSD Post-Hoc Test Done on the Two Groups for Difference between Adjusted Post-Test Paired Means on Endurance

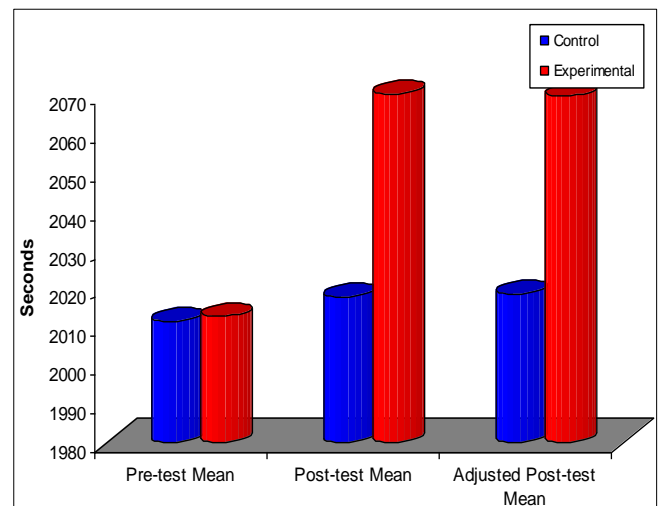
Adjusted Post-test means		Mean Difference	Std. Error	P-value
Control group	Experimental group			
2018.26	2069.41	50.72*	9.64	P<.000**

\* 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 50.72 and a P-value of 0.000. This do clearly show that, there existed significant



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

**Conclusion**

The results of the study indicate that there was significant difference on Coordination among the control group and the experimental group since, there was significant training effect on Coordination of the experimental group after the plyometric training programme.

Plyometrics is a method of developing explosive power and strength 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.

There was no significant difference on Coordination among the control group and the experimental group, as there was no effect on Coordination of the subjects of both the groups after the plyometric training programme

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