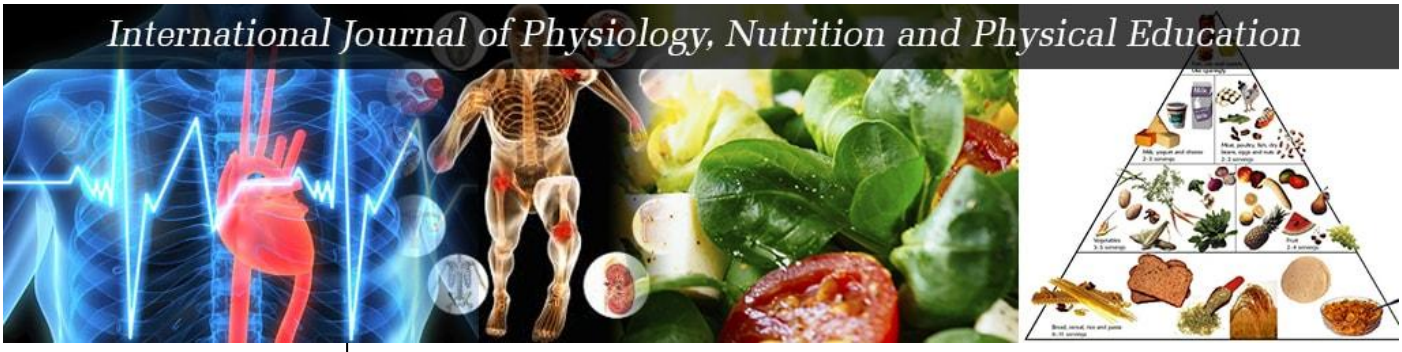

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Effect of plyometric exercises on static balance amonf the kho-kho players

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Abstract
The aim of the study was to determine the effect of plyometric training on static balance. Sixty Kho-Kho (N=60 were randomly selected as subjects and their age ranged between 16 and 18 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. Static balance. 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 static balance ($P \leq 0.05$) Further it related that the plyometric training and plyometric training produced significant improvement($P \leq 0.05$) on static balance as compared to control group.

Keywords: plyometric training, static balance.

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 analysed 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.

Static Balance
It is the ability to maintain the body position over its base of support irrespective of base being stationary or moving. Static balance refers to the ability of a stationary on object to its balance. This happens when the objects centre of gravity is on the axis of rotation. Whereas dynamic balance is the ability of an object to balance whilst in motion or when switching between positions. Static balance involves maintaining a desired shape in a stationary position. For this to happen, the centre of gravity needs to be over the base of support. The wider the base of support and the closer the centre of gravity is to the base of support, the easier it is to balance. When body parts extend to one side beyond the base of support, the body needs to make a corresponding extension in the opposite direction to achieve counterbalance (Sport NZ FMS Manual).
The word Plyometric is derived from the Greek word *pleythyein* meaning "to increase" or from the Greek roots *plio* and metric meaning 'More' and 'Means'. Plyometric refers to exercises that enable a muscle to reach maximal strength in as shorter time as possible. Plyometric exercises are important in sports requiring high levels of static balance 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 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. Speed 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 agility

	Control group	Experimental group	Source of Variance	Sum of Squares	df	Mean Squares	F-ratio	P-value
Pre-test Mean	10.193	10.178	Between	0.004	1	0.004	0.099	0.754
S.D.	0.163	0.211	Within	2.066	58	0.036		
Post-test Mean	10.153	9.943	Between	0.659	1	0.659	38.017**	0.000 P<.001
S.D.	0.117	0.145	Within	1.006	58	0.017		
Adjusted Post-test Mean	10.149	9.947	Between	0.610	1	0.610	75.028**	0.000 P<.001
S.D.	0.016	0.016	Within	0.463	57	0.008		

** 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 Agility. The post-test values are the values of the variable Agility, while the pre-test variable is taken as the co-variate. The P-value of 0.754 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 75.028 on the adjusted post-test means and this do implies that there existed mean difference on the variable Agility 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 Agility 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 agility

Adjusted Post-test means		Mean Difference	Std. Error	P-value
Control group	Experimental group			
10.15	9.94	0. 21*	0.023	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 0.21 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.

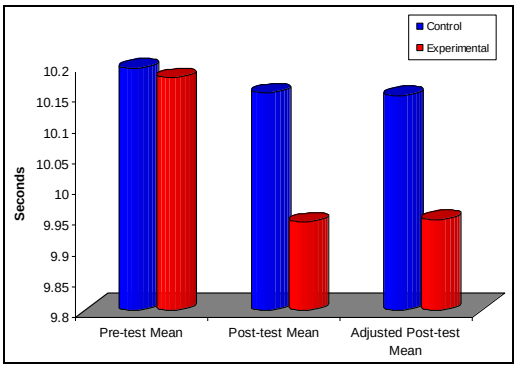

Fig 1: Graphical Representation of the Pre-test, Post-test and Adjusted Post-test Means on Agility of the two different groups

Conclusion

There was significant difference between the two groups on static balance. This indicates that the plyometric training programme does have had significant effect, so as to improve static balance.

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

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