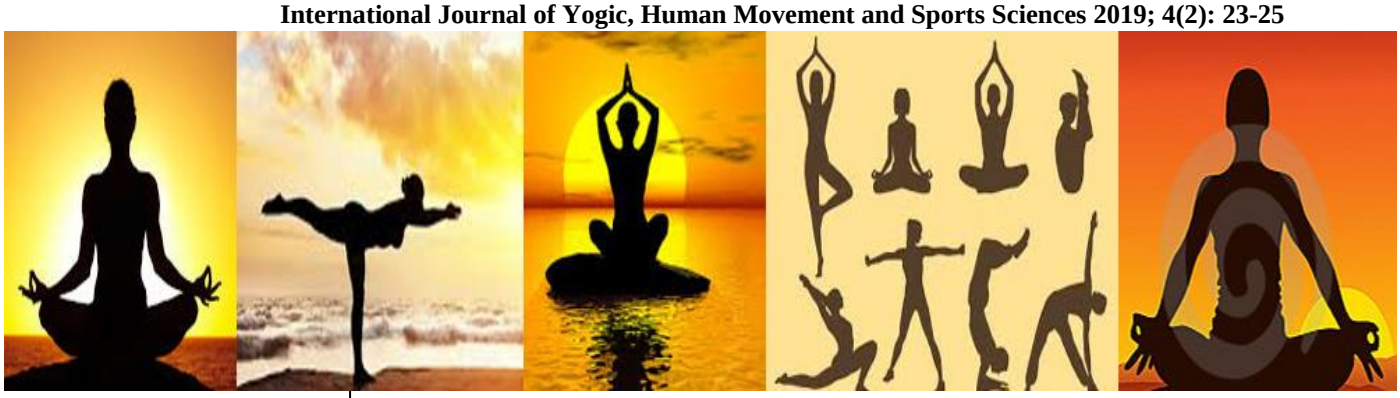
International Journal of Yogic, Human Movement and Sports Sciences 2019; 4(2): 23-25



**ISSN: 2456-4419**
**Impact Factor: (RJIF): 5.18**
Yoga 2019; 4(2): 23-25

www.theyogicjournal.com
Received: 16-05-2019
Accepted: 20-06-2019

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

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

# Effect of plyometric exercises on agility among the Kho-Kho players

## Dr. SS Biju

**Abstract**
The aim of the study was to determine the effect of plyometric training on agility. 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. Agility 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 speed ($P \leq 0.05$) Further it related that the plyometric training and plyometric training produced significant improvement($P \leq 0.05$) on agility as compared to control group.

**Keywords:** Plyometric training, agility

## 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.

It is the ability of the body or the parts of the body to change direction rapidly and accurately. At present, no agreement on a precise definition of agility within the sports science community exists. The term is applied to a broad range of sport contexts, but with such great inconsistency, it further complicates our understanding of what trainable components may enhance agility. A new definition of agility is proposed: "a rapid whole-body movement with change of velocity or direction in response to a stimulus". Agility has relationships with trainable physical qualities such as strength, power and technique, as well as cognitive components such as visual-scanning techniques, visual-scanning speed and anticipation. Agility testing is generally confined to tests of physical components such as change of direction speed, or cognitive components such as anticipation and pattern recognition. New tests of agility that combine physical and cognitive measures are encouraged.

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 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.

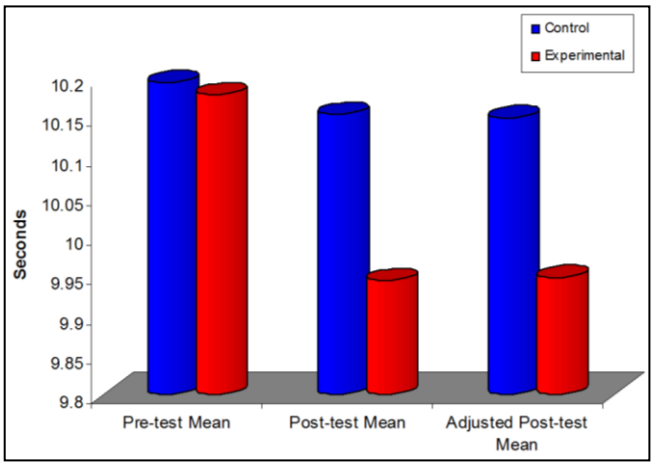



**Fig 1:** Graphical representation of the pre-test, post-test and adjusted post-test means on agility of the two different groups

## Conclusion

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

## References

1. Aggarwal JC. Educational Research, (New Delhi: The Arya Book Depot, 1975.
2. Anita Bean. The Complete Guide to Strength Training, London: A and C Black Publishers Ltd, 1997.
3. Arnhein Daniel D. Modern Principles of Athletic Training, St. Louis: The Mosby College Publishing Co, 1985.
4. Baechle Thomas R. (Ed.), Essential of Strength Training and Conditioning, Champaign, Illinois: Human Kinetics, 1994.

5. Barrow Harold M. Man and his Movement Principles of Physical Education, Philadelphia: Lea and Febiger, 1971.
6. Bompa Tudor O. Periodization of Strength, Canada: Vertices Publishing Inc, 1996.
7. Cooper John M. Mavlene Adrian and Ruth B. Glassow, *Kinesiology,* (5th Ed.), (St. Louis: The C.V. Mosby Company, 1982.
8. Cooper John M, Mavlene Adrian, Ruth B Glassow. *Kinesiology,* (5th ed.) Dick, Frank W., *Sports Training Principle,* London: Hendry Kimpton Publisher, 1980.
9. Gardiner NE. Athletes of the Ancient World, Oxford: University, Press, 1930.
10. Grosset, Dunlap. Enjoying Track and Field Sports, (London: The Padington Press Ltd, 1979.
11. Hooks Gene. Application of Weight Training to Athletics, Engle Wood Cliffs: New Jersey, Prentice Hall. Inc, 1962.
12. Janner JM. The Physique of the Olympic, (London: The George Allen and Unwin Ltd, 1969.
13. Jensen Clayue R, A Garth Fishes. Scientific Basis of Athletic Conditions, (Philadelphia: The Lea and Febiger Publishers, 1979.
14. Johnson Barry L, Jack K. Nelson. Practical Measurement for Education in Physical Education, New Delhi: Surjeet Publication, 1982.
15. Phillips Allen D, Sandra A. Street, Sprint Assisted Training Programme, Track Technique, 1989.
16. Riley Daniel P. (Ed.), Strength Training (2nd Ed.), New York: Leisure Press, 1982.
17. Singh, Hardayal. Sports Training General Theory and Education Method, (New Delhi: D.V.S. Publication, 1991.
18. Blakey JG, D Southard. The Combined Effects of Weight Training and Plyometric on Dynamic Leg Strength and Leg Power, Journal of Applied Sports Science Research, 1987.
19. Delecluse C. *et al.* Influence of High-Resistance and High-Velocity Training on Sprint Performance, Journal of Medicine Science Sports and Exercise, 1995, 27(8).
20. Fatouros JG, A Jamurtas, P Buckenmoyer. Effects of Plyometric Training and Weight Training on Force-Power Parameters of Vertical Jumping, Medicine and Science in Sports and Exercise, 1992, 24(5).
21. 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).
22. Hisaeda *et al.* Influence of Two Different Modes of Resistance Training in Female Subjects, Ergonomics, 1996, 39(6).
23. 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).
24. Jones K *et al.,* The Effect of Compensatory Acceleration on Upper Body Strength and Power, Journal of Strength and Conditioning Research, 1996, 10(1).
25. Otte RA. Effects of Isotonic and Plyometric Training on Upper Body Power of Ninth and Tenth Grade Males, Completed Research in Health, Physical Education, Recreation and Dance, 1992, 34.