



# EFFECT OF PLYOMETRIC TRAINING ON AGILITY AMONG UNIVERSITY HOCKEY PLAYERS

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**ABSTRACT:** The purpose of the study was to find out the effect of plyometric training on agility among university hockey players. To achieve this purpose of the study, thirty hockey players were selected as subjects who were from the various colleges affiliated University of Delhi. The selected subjects were aged between 18 to 22 years. They were divided into two equal groups of fifteen each, Group I underwent plyometric training programme and Group II acted as control that did not participate in any special training apart from their regular curricular activities. The subjects were tested on selected criterion variable such as agility prior to and immediately after the training period. The selected criterion variable such as agility was measuring by Hexagonal Obstacle Test. The analysis of covariance (ANCOVA) was used to find out the significant differences if any, between the experimental group and control group on selected criterion variable. In the cases, 0.05 level of confidence was fixed to test the significance, which was considered as an appropriate. The result of the present study has revealed that there was a significant difference among the experimental and control group on agility.

**Keywords:** plyometric training-physical-agility-university hockey players.

## 1. Introduction

The primary objective of sports training is to stress various bodily systems to bring about positive adaptation in order to enhance sporting performance. To achieve this objective, coaches and athletes systematically apply a number of training principles including overload, specificity and progression, organized through what is commonly termed periodisation. The application of these principles involves the manipulation of various programme design variables including choice of exercise, order of training activities/exercises, training intensity (load and repetition), rest periods between sets and activities/exercises and training frequency and volume in order to provide periods of stimulus and recovery, with the successful balance of these factors resulting in positive adaptation.

Plyometrics refers to a type of intense training that maybe undertaken by an athlete who wants to improve speed power. This type of training also refers to very fast, explosive excision (normally performed with body weight) to improve power out-put and neural activation of the mussels (the ability for a muscle to contract quickly). Basically phonetics relies on an element of physiology call the stretch-shorten cycle (s&c). This stretch-shorten cycle means that the muscle is rapidly stretched and then contracted which increases the force applied on the muscle. Receptors within the muscle called muscle spindles react to this sudden stretching by sending a signal to the brain saying this stretching is potentially dangerous than the train contracts the muscle to stop the stretching this serves to protect the stretch and prefect against any possible injury. The pre-stretch is the sac must be used by 0.2 of a second or otherwise same type of bounce or any possible advantage gained by sac is lost. So recapping, the sac is initiated by the muscle spindles which defects a stretch and responds by causing the muscle to contract.

Throughout this century and no doubt long before, jumping, bounding and hopping exercises have been used in various ways to enhance athletic performance on recent years. This distinct method of training for power or

explosiveness has been termed as plyometrics. Whatever the origins of the word the term is used to describe the method of training which seeks to enhance the explosive reaction of the individual through powerful muscular contraction as a result of rapid eccentric contractions.

## 2. Methodology

The purpose of the study was to find out the effect of plyometric training on agility among university hockey players. To achieve this purpose of the study, thirty university hockey players were selected as subjects who were represented inter collegiate tournament conducted by University of Delhi and the players practiced in the Shivaji Stadium, New Delhi. The selected subjects were aged between 18 to 22 years. They were divided into two equal groups of fifteen each, Group I underwent plyometric training programme and Group II acted as control that did not participate in any special training apart from their regular curricular activities. The experimental group underwent the training programme for three days per week for eight weeks. Among the physical variable such as agility was measuring by Hexagonal Obstacle Test.

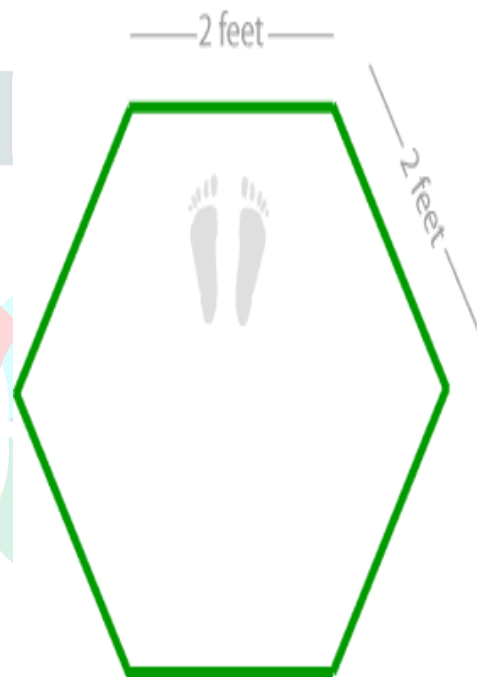
### 2.1 Agility (Hexagonal Obstacle Test)

Using athletic tape, mark a hexagon (six sided shape) on the floor. The length of each side should be 24 inches (60.5 cm), and each angle should work out to be 120 degrees.

The person to be tested starts with both feet together in the middle of the hexagon facing the front line. On the command 'go', they jump ahead across the line, then back over the same line into the middle of the hexagon. Then, continuing to face forward with feet together, jump over the next side and back into the hexagon. Continue this pattern for three full revolutions. Perform the test both clockwise and anti-clockwise.

### Scoring

The athletes score is the time taken to complete three full revolutions. The best score from two trials is recorded. Comparison of the anti-clockwise and clockwise directions will show if any imbalances exist between left and right movement skills.



## 3. Results

Findings: The mean and standard deviation scores of pretest, posttest and adjusted posttest of agility on plyometric training and control group are given in table. 'F' ratio test computed in regards to the agility on plyometric training and control group in the pretest, posttest and adjusted post test are also presented in table.

Table: MEAN STANDARD DEVIATION AND 'F' RATIO OF PLYOMETRIC TRAINING AND CONTROL GROUP ON AGILITY

	Exp Group	Control Group	Source of Variance	Sum of Squares	Df	Mean Squared	'F' ratio
Agility							
Pre test Mean	11.34	11.32	Between	0.28	1	0.28	1.08
S D	0.78	0.75	Within	7.13	28	0.26	
Post test Mean	10.86	11.41	Between	8.24	1	8.24	22.89*
S D	0.87	0.76	Within	10.12	28	0.36	
Adjusted posttest Mean	10.92	11.38	Between	16.54	1	16.54	32.43*
			Within	13.77	27	0.51	

The agility pre means were 11.34 for the plyometric training group and 11.32 for the control group. The resultant 'F' ratio of 1.08 was not significant at .05 levels indicating that the two groups were no significant variation. The post test means were 10.86 for the plyometric training group and 11.41 for the control group. The resultant 'F' ratio of 22.89 at .05 level indicating that it was significant. The difference between the adjusted post-test means of 10.92 for the plyometric training group and 11.38 for the control group yield on 'F' ratio 32.43 which was significant at .05 level.

The result of this study showed that there was a significant difference between plyometric training and control group on agility.

#### 4. Discussion/Conclusions

The findings of the study showed that there was no significant difference between the pretest of agility.

The findings of the study showed that there was a significant difference between the posttest and adjusted posttest of agility.

The results of the study have shown there was a significant difference among plyometric training group and control group on agility reference to the past studies on selected physical fitness variable such as agility in accordance with Meylan and Malatesta (2009) and Miller and others (2006).

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