

# Effect of Plyometric Exercises on the Selected Motor Abilities of Female Players

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## Abstract

The purpose of the study was to find out the effect of plyometric exercises on the selected motor abilities of female basketball players. To achieve the purpose of the study forty female Basketball Players of Uttar Pradesh were selected for this study. The selected subjects were divided into two equal groups of 20 subjects each such as experimental group and control group. The experimental group was given a systematic and progressive program of plyometric training for three days for ten weeks. Control group did not participate in any special training program and followed the daily routine. The subject's age ranged from 18 to 25 years. The variables for study were speed, agility, and endurance. Analysis of co-variance (Ancova) was used to find out the significant differences if any between the experimental group and control group. The level of significance was set at 0.05 level. The result showed significant differences in speed and agility and insignificant differences in endurance

**Keywords:** Plyometric Training, Speed, Agility and Endurance

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## I. Introduction

In modern Basketball a player is required to continuously be on the move over a certain period of time i.e. 40 minutes varying his pace from slow to fast or medium and vice versa and many times jumping, hopping and changing directions in movement. This puts a great deal of demand in terms of physical effort on the part of each player. To really enjoy the game of basketball one needs to develop proficiency in the skill of ball handling. Shooting for goals and defending against opponent's play (Schaafsma, 2019).

Plyometric (Plyo-more or greater, metric-measured or quantity) exercise is based upon the belief that a rapid lengthening of a muscle just prior to the contraction will result in a much stronger contraction (Clutch, 2003). Origin of the term plyometrics is derived from the word *plyethyein* which means to increase or from the Greek word *'plio'* and *'metric'* which means 'more and measure' respectively. Other terms used in conjunction with plyometric are depth jumping, box jumping and jump training (Bedi, 2014). Plyometric training is an excellent method of developing body power and it is proved a very effective method for improving explosive strength. It offers rich variation of exercise and load structure any activity that activates that stretch reflex mechanism is plyometric exercise (Phil, 2014).

## II. Material and Methods

The purpose of the study was to find out the effect of plyometric exercises on the selected motor abilities of female basketball players. To achieve the purpose of the study forty female Basketball Players of Uttar Pradesh were selected for this study as subjects at random basis. The selected subjects were divided into two equal groups of 20 subjects each such as experimental group and control group. The experimental group was given a systematic and progressive program of plyometric training for five days for ten weeks. Control group did not participate in any special training program and followed the daily routine. The subject's age ranged from 18 to 25 years.

### Selected Variables

Speed-Speed was measured by 50 m dash. The score was recorded to the nearest tenth of a second.

Agility: Agility was measured by using 4 x 10 m shuttle run. The score was recorded to the nearest tenth of a second.

Endurance 12 min run-walk test was used to measure the cardio-vascular endurance and it was recorded nearest every 25 meters.

### Statistical Analysis

Analysis of co-variance (Ancova) was used to find out the significant differences any between the experimental group and control group. The level of significance was set at 0.05 level.

### Training Programme

For experimental group, training was given three alternate days (Monday, Wednesday, and Friday in a week for ten weeks. Training was given for one session in the morning only. Workout lasted for 40 to 50 minutes approximately including warming up and cooling down special programme apart from their regular activity.

### III. Results and Discussion

**Table-1**  
**ANALYSIS OF COVARIANCE OF THE MEANS OF THE EXPERIMENTAL AND CONTROL GROUP FOR SPEED**

| Test                     | Mean |       | Mean Sum of Squares | Mean Sum of Squares | F ration |
|--------------------------|------|-------|---------------------|---------------------|----------|
|                          | Exp. | Cont. |                     |                     |          |
| Pre Test Means           | 9.77 | 9.73  | .016                | .016                | .043     |
|                          |      |       | 14.20               | .374                |          |
| Post Test Means          | 9.31 | 9.67  | 1.33                | 1.33                | 4.65     |
|                          |      |       | 10.87               | .286                |          |
| Adjusted post Test Means | 9.30 | 9.68  | 1.40                | 1.40                | 0.523    |
|                          |      |       | 9.94                | .269                |          |

The Table 1 shows that the pre-test means of plyometric training group and control group on speed were 9.77 and 9.73 respectively. The obtained F-ratio of 043 for pre-test is less than the table value of 4.10 for df 1 and 38 required for significant at .05 level of significance. The post-test means of plyometric training group and control group were 9.31 and 9.67 respectively. The obtained F-ratio of 4.65 for post-test is greater than the table value of 4.10 for df 1 and 38 required for significant at .05 level of significance. The adjusted post-test means of plyometric training group and control group were 9.30 and 9.68 respectively. The obtained F. ratio of 5.23 for adjusted post-test is greater than the table value of 4.10 for df 1 and 37 required for significant at 05 level of significance.

The post-test means of plyometric training group and control group were 11.51 and 12.07 respectively. The obtained F-ratio of 7.88 for pre-test is greater than the table value of 4.10 for df 1 and 38 required for significant at .05 level of significance. The adjusted post-test means of plyometric training group and control 11.50 and 12.07 respectively. F-ratio of 9.11 for adjusted post-test is greater than the table value of 4.10 for df 1 and 58 required for significant at .05 level of significance.

**Table-2**  
**ANALYSIS OF COVARIANCE OF THE MEANS OF THE EXPERIMENTAL AND CONTROL GROUP FOR AGILITY**

| Test                     | Groups |       | Sum of Squares | Mean Sum of Squares | F ration |
|--------------------------|--------|-------|----------------|---------------------|----------|
|                          | Exp.   | Cont. |                |                     |          |
| Pre Test Means           | 12.06  | 12.02 | .012           | .012                | .041     |
|                          |        |       | 14.20          | .374                |          |
| Post Test Means          | 11.51  | 12.07 | 3.13           | 3.13                | 7.88     |
|                          |        |       | 10.87          | .286                |          |
| Adjusted post Test Means | 11.50  | 12.07 | 3.28           | 3.28                | 9.11     |
|                          |        |       | 13.34          | .361                |          |

The Table 2 shows that the pre-test means of plyometric training group and control group on Agility were 12.06 and 12.02 respectively. The obtained F-ratio of 041 for pre-test is less than the table value of 4.10 for df 1 and 38 required for significant at .05 level of significance.

**Table-3**  
**ANALYSIS OF COVARIANCE OF THE MEANS OF THE EXPERIMENTAL AND CONTROL GROUP FOR ENDURANCE**

| Test                     | Groups  |         | Sum of Squares | Mean Sum of Squares | F ration |
|--------------------------|---------|---------|----------------|---------------------|----------|
|                          | Exp.    | Cont.   |                |                     |          |
| Pre Test Means           | 1530    | 1512.50 | 3062.50        | 3062.50             | 2.213    |
|                          |         |         | 27562.50       | 27562.50            |          |
| Post Test Means          | 1582.50 | 1530    | 27562.50       | 27562.50            | 2.213    |
|                          |         |         | 473375         | 12457.24            |          |
| Adjusted post Test Means | 1577.74 | 1534.75 | 18394.73       | 18394.73            | 2.371    |
|                          |         |         | 207037.24      | 775.76              |          |

The Table 3 shows that the pre-test means of plyometric training group and control group on Endurance were 1530 and 1512.5 respectively. The obtained F-ratio of 184 for pre-test is less than the table value of 4.10 for df 1 and 38 required for significant at .05 level of significance. The post-test means of plyometric training group and control group were 1582.50 and 1530 respectively. The obtained F-ratio of 2.213 for post-test is less than the table value of 4.10 for df 1 and 38 required for significant at .05 level of significance. The adjusted post-test means of plyometric training group and control group were 1577.74 and 1534.75 respectively. The obtained F-ratio of 2.371 adjusted post-test is less than the table value of 4.10 for df 1 and 37 required for significant at .05 level of significance.

#### **IV. Conclusion**

On the basis of results and within the limitation of study the following conclusions were drawn:

The result of the study indicated that there were significant differences between plyometric training group and control group on speed and agility and it was also found that there were significant improvements on speed and agility due to the plyometric training.

The result of the study indicated that there was no significant difference between plyometric training group and control group on Endurance and it was also found that there was no significant improvement on Endurance due to the plyometric training.

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