

IMPACT OF PLYOMETRIC TRAINING AND MOBILITY EXERCISE  
ON SELECTED SPEED AND FLEXIBILITY MEASURES  
AMONG COLLEGE MEN BASKETBALL PLAYERS

**P.Ramesh Kannan, Ph.D Scholar,**

**SRM IST, Department of Physical Education and Sports- Chennai**

**Dr Jesus Rajkumar, Assistant Professor,**

**SRM IST, Department of Physical Education and Sports - Chennai**

**K.Nagajothi, Ph.D Scholar,**

**SRM IST, Department of Physical Education and Sports - Chennai**

ABSTRACT

*The purpose of the study was to find out the impact of plyometric training and mobility exercise on selected speed and flexibility measures among college men basketball players. To achieve the purpose of the study forty five basketball players from SRM IST , Chennai were selected at random and their age ranged from 18 to 25 years. The subjects were divided into three equal groups of fifteen each. Group I acted as Experimental Group plyometric training and Group II Experimental mobility exercise and group III act as Control Group. The requirement of the experiment procedure testing as well as exercise schedule was explained to the subjects so as to get full co-operation of the effort required on their part and prior to the administration of the study. The study was formulated as a post test only random group design. The duration of experimental period was 8 weeks. After the experimental treatment, all the subjects were tested on speed and flexibility. This final test scores formed as post test scores of the subjects. The post test scores were subjected to statistical analysis using analysis of co-variance. In all case 0.05 level of confidence was fixed to test hypotheses. The plyometric training and mobility exercise , both in natural/terrestrial and artificial conditions, has been established as an effective means to improve on speed and flexibility among college men basketball players after undergoing plyometric and mobility training for a period of 8 weeks.*

*Keyword: plyometric training, mobility exercise, speed, flexibility, basketball players*

## INTRODUCTION

Plyometrics (Plyo – more greater, metric – measured quantity) exercises is based upon the belief that a rapid lengthening of a muscle just prior to a contraction will result in a much stronger contraction.. They are very dynamic measurements which use gravitational force body and the contractibility and elasticity of muscle tissue to increase the force of stress on related muscles. Plyometric training may be viewed as an extension of the ‘shock’ method of strengthening muscles for athlete’s performance recommended by Verkhoshonkia Russian Jumping event Coach (1966).

Mobility, particularly in the ankles and hips, is vital for staying injury-free and moving efficiently during the season. Every time a player runs or jumps (which happens occasionally in basketball), they perform "triple extension" — they extend at the ankles, they extend at the knees, and they extend at the hips. If any one of those three joints can't go through a full range of motion, then the player won't be able to run as fast or jump as high as they are capable of. Conversely, every time a player lands from running and jumping, they want the impact to dissipate through those same three joints. If any one of those three joints can't flex properly to absorb the impact, it adds tremendous pressure to the next closest joint. For example, a player with tight, immobile ankles or hips is not only limiting their potential to run and jump, they are also causing additional, and unnecessary, impact on their knees. There are a number of simple exercises that help improve ankle mobility while strengthening them to protect against injury. Add these exercises into your regular workout routine and practices to improve performance and prevent strains, breaks and sprains.

## METHODOLOGY

The purpose of the study was to find out the Impact of plyometric training and mobility exercises on selected physical variables among men basketball players. To achieve the purpose of the study, 45 basketball players from SRM IST were selected. The selected subjects’ age group was ranging from 18 to 25 years. The subjects were randomly divided into three groups and each group consisted of 15 subjects. Group I acted as plyometric training, Group II acted as mobility exercises, Group III acted as control group. Group I and II participated their respective treatments for a period of twelve weeks and no training were given to the control group. The

three groups were statistically analyzed by using analysis of covariance (ANCOVA). In case of significance of mean difference was observed on the criterion measure, as a post – hoc test, the Scheffe's test was applied to find out which pair of group is high among the others.

**Table –I**

<b>Independent variable</b>	<b>Dependent variable</b>
Plyometric training	Speed
Mobility training	Leg explosive power

**Table – II**

<b>S.NO.</b>	<b>VARIABLES</b>	<b>TEST ITEMS</b>	<b>UNITS</b>
1	Speed	50 Mts Run	Seconds
2	flexibility	Sit and reach	centimeters

**Table-1.3**

**Analysis of Covariance for the Pre, Post and Adjusted Post Test Means Values for Plyometric Training Group, Mobility Exercise Group and Control Group on Speed**

<b>Test</b>	<b>PTG</b>	<b>MEG</b>	<b>CG</b>	<b>Sum of variance</b>	<b>Sum of Squares</b>	<b>Df</b>	<b>Mean Squares</b>	<b>F ratio</b>
<b>Pre Test Mean</b>	7.54	7.65	7.87	BG	0.81	2	0.40	1.35
				WG	12.58	42	0.30	
<b>Post Test Mean</b>	6.82	6.68	7.58	BG	7.04	2	3.52	<b>20.18*</b>
				WG	7.32	42	0.17	
<b>Adjusted Post Test Mean</b>	6.84	6.69	7.55	BG	6.03	2	3.01	<b>17.82*</b>
				WG	6.93	41	0.16	

**\*Significant at 0.05 level of confidence**

The pre-test means on speed of plyometric training group and mobility exercise group and control group were 7.54, 7.65 and 7.87 respectively. The 'F' value observed for the pre-test on speed was 1.35. It fails to reach the table value of 3.22 for degree of freedom 2, 42 at 0.05 level of confidence. The post-test means on speed of plyometric training group and mobility

exercise group and control group were 6.82, 6.68 and 7.58 respectively. The 'F' value observed for the post-test on speed was 20.18. It was greater than the table value of 3.22 for degree of freedom 2, 42 at 0.05 level of confidence. The adjusted post-test means on speed of Plyometric training group and Mobility exercise group and control group were 6.84, 6.69 and 7.55 respectively. The 'F' value observed for the adjusted post-test on speed was 17.82. It was greater than the table value of 3.23 for degree of freedom 2, 41 at 0.05 level of confidence. Compare with control group speed have significant improvement in the plyometric and mobility training groups.

**Table-1.4**

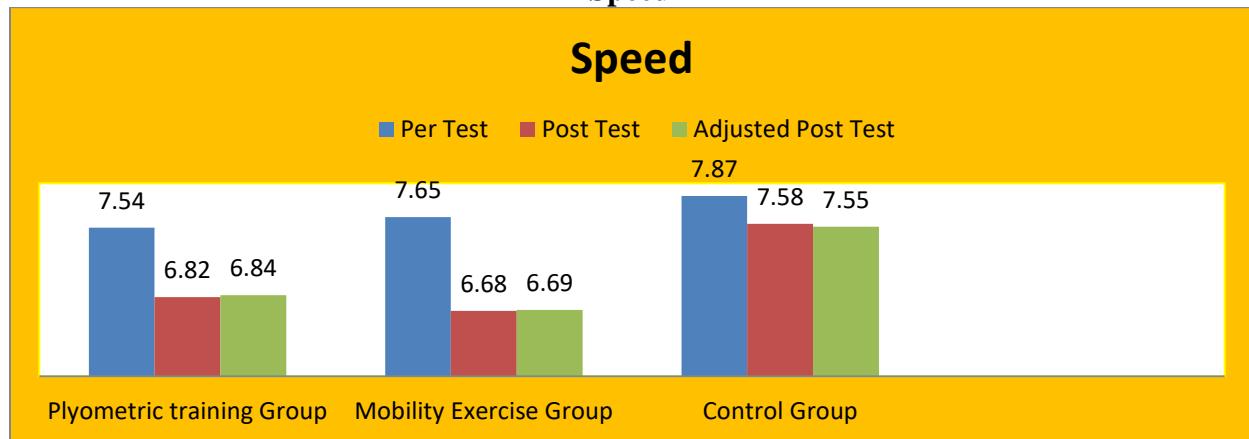
**The Scheffe's Test for the Difference between Paired Means on Speed**

Means			Mean Difference	Required CI
PTG	MEG	CG		
6.84	----	7.55	<b>0.71*</b>	0.47
----	6.69	7.55	<b>0.80*</b>	0.47
6.84	6.69	----	0.15	0.47

**\*Significant at 0.05 level of confidence**

The adjusted post mean values of Plyometric training group and Mobility exercise group and control group were 0.71, 0.80 and 0.15 respectively. The required confidence interval value was 0.47. Since the obtained mean differences between experimental groups and control group are greater than the obtained critical interval value on speed, It was concluded that the mobility exercise group is better than the plyometric training group and control group.

**Figure 1.5**  
**Bar Diagram Showing the Pre, Post and Adjusted Post Test Mean Values of Plyometric Training Group, Mobility Exercise Group and Control Group on Speed**



**Table-1.6**  
**Analysis of Covariance for the Pre, Post and Adjusted Post Test Means Values for Plyometric Training Group, Mobility Exercise Group and Control Group On Flexibility**

Test	PTG	MEG	CG	Source of Variance	Sum of Squares	Df	Mean Squares	F ratio
Pre Test Mean	21.53	22.46	21.06	BG	15.24	2	7.26	1.66
				WG	192.40	42	4.58	
Post Test Mean	29.93	27.93	20.73	BG	619.20	2	309.60	<b>63.86*</b>
				WG	203.60	42	4.84	
Adjusted Post Test Mean	29.27	27.27	21.27	BG	505.46	2	252.73	<b>185.90*</b>
				WG	55.73	41	1.35	

**\*Significant at 0.05 level of confidence**

The pre-test means on flexibility plyometric training group, mobility exercise group and control group were 21.53, 22.46 and 21.06 respectively. The 'F' value observed for the pre-test on flexibility was 1.66. It fails to reach the table value of 3.23 for degree of freedom 2, 42 at 0.05 level of confidence. Based on the results it was conformed that the mean differences among the

plyometric training group, mobility exercise group and control group, on flexibility before start of the respective treatments were found to be insignificant. The post-test means on flexibility of plyometric training group, mobility exercise group and control group were 29.93, 27.93 and 20.73 respectively. The 'F' value observed for the post-test on speed was 63.86. It was greater than the table value of 3.23 for degree of freedom 2, 42 at 0.05 level of confidence. Since the observed F-value on post test means among the groups namely plyometric training group, mobility exercise group and control group on flexibility was highly significant as the value was higher than the required table value of 3.23. Thus the results obtained proved that the training on flexibility produced significantly improvements among the experimental groups. The adjusted post-test means on flexibility of plyometric training group, mobility exercise group and control group were 29.27, 27.27 and 21.27 respectively. The 'F' value observed for the adjusted post-test on flexibility was 185.90. It was greater than the table value of 3.23 for degree of freedom 2, 41 at 0.05 level of confidence. Since the observed F-value on adjusted post test means among the groups namely plyometric training group, mobility exercise group and control group on flexibility was highly significant as the value was higher than the required table value of 3.23.

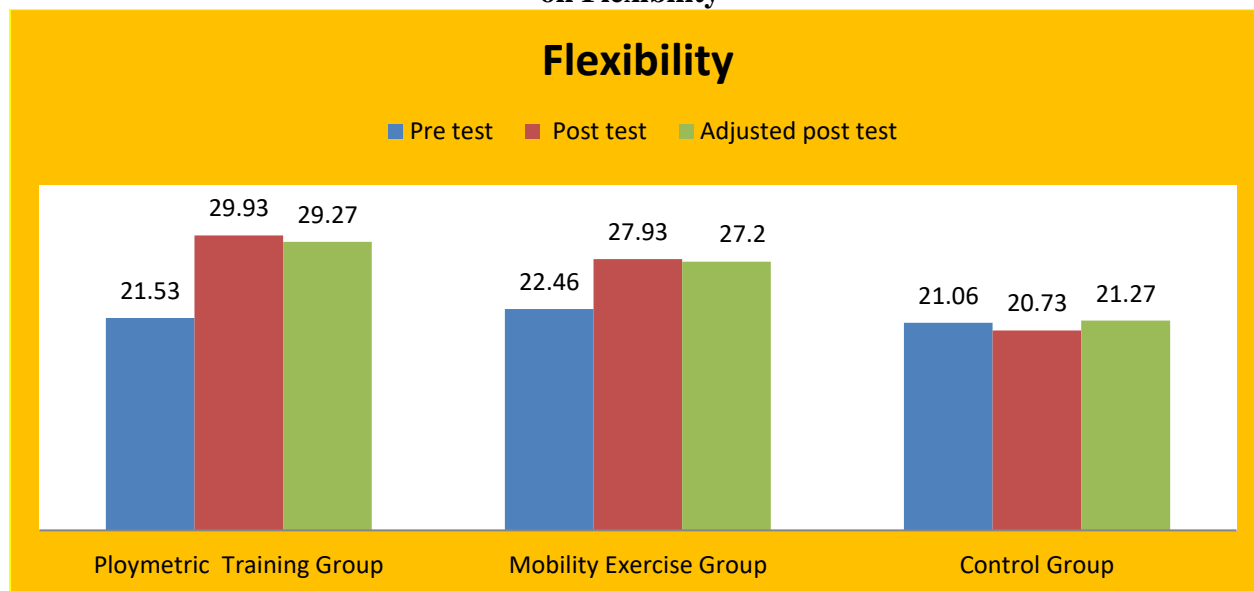
**Table-1.7**  
**The Scheffe's Test for the Difference between Paired Means on Flexibility**

Means			Mean Difference	Required CI
PTG	MEG	CG		
29.27	----	21.27	<b>7.99*</b>	2.07
----	27.27	21.27	<b>5.99*</b>	2.07
29.27	27.27	----	2.01	2.07

**\*Significant at 0.05 level of confidence**

The table 1.5 shows that the significant difference of paired adjusted post test means of plyometric training group, mobility exercise group, and control group on Flexibility. The obtained mean differences between plyometric training group and control group, mobility exercise group and control group and plyometric training group and mobility exercise group were 5.99, 7.99 and 2.01 respectively. The required confidence interval value was 2.07

**Figure 1.8**  
**Cylinder Diagram Showing the Pre, Post and Adjusted Post Test Mean Values of Plyometric Training Group, Mobility Exercise Group and Control Group on Flexibility**



## Conclusions

Based on the research findings the following conclusions were drawn

1. The Plyometric training and Mobility Exercise group has achieved significant positive improvement on speed and flexibility when compared to the control group.
2. The Plyometric training and Mobility Exercise group has achieved significant positive improvement on speed among men Basketball players.
3. The Plyometric training and Mobility Exercise group has achieved significant positive improvement on flexibility variables among men Basketball players.

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