

Effect of Plyometric Training and Mobility Exercises on Selected Physical and Physiological Variables among Men Basketball Players

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Abstract

The purpose of this study was to find out the effect of plyometric training and mobility exercises on selected physical and physiological variables among men basketball players. To achieve the purpose of the study, 45 basketball players from Arul Anandar colleges from karumathur 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. The random group design was employed. Experimental Group one underwent plyometric training for six weeks. Experimental Group two underwent mobility exercises for six weeks. The control group did not participate in any experimental treatment except of their regular activities. The subjects were tested of their physical and physiological variables prior to and after the experiment. The data collected were tested for the differences which were considered. The normality of the data was found through mean, standard deviation and F ratio and the data collected was found to be normal. The data collected on selected criterion variables were subjected to statistical analyze using analysis of covariance (ANCOVA) to find out the significant difference if any, between the groups on selected criterion variables separately. In all the cases, 0.05 level of confidence was fixed to test the significance, which was considered as appropriate

Keywords: *Plyometric Training, Mobility Exercises, speed, Resting heart rate.*

Introduction

The word Training has been a part of human language since ancient times. It denotes the process of preparation for some task. This process invariably extends to a number of days

and even months and years. The term Training is widely used in sports. There is, however, some disagreement among sports coaches and also among sports scientists regarding the exact meaning of this word. Some experts, especially belonging to sports medicine, understand sports training as basically doing physical exercises.

Sports' training is done for improving sports performance. The sports performance, as any other type of human performance, is not the product of on single system or aspect of human personality. On the contrary, it is the product of the total personality of the sports person. The personality of a person has several dimensions e.g., physical, physiological, social and psychic. In order to improve sports performance, the social and psychic capacities of the sports person also have to be improved in addition to the physical and physiological ones. In other words the total personality of a sportsman has to be improved in order to improve his performance. Sports' training, therefore, directly and indirectly aims at improving the personality of the sportsman. No wonder, therefore, sports training is an educational process.

Methodology

The purpose of this study was to find out the effect of plyometric training and mobility exercises on selected physical and physiological variables among men basketball players. To achieve the purpose of the study, 45 basketball players from Arul Anandar colleges from karumathur 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. The random group design was employed. Experimental Group one underwent plyometric training for six weeks. Experimental Group two underwent mobility exercises for six weeks. The control group did not participate in any experimental treatment except of their regular activities. The subjects were tested of their physical and physiological variables prior to and after the experiment. The data collected on selected criterion variables were subjected to statistical analyze using analysis of covariance (ANCOVA) to find out the significant difference if any, between the groups on selected criterion variables separately. In all the cases, 0.05 level of confidence was fixed to test the significance, which was considered as appropriate

Independent variable

1. Plyometric Training
2. Mobility Exercises

Dependent variables

1. speed
2. Resting heart rate

Table-1
Selection of variables & tests items

S. No	Physical & Physiological Parameters	Test items and test instruments	Unit of measurements
1	Speed	50meters run	Seconds
2	Resting heart rate	Digital blood pressure monitor	Millimeter of mercury

Table-2
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 (PTG, MEG and CG)

Test	PTG	MEG	CG	Sum of variance	Sum of Squares	Df	Mean Squares	F ratio	Table Value
Pre Test Mean	7.54	7.65	7.87	BG	0.81	2	0.40	1.35	3.22
				WG	12.58	42	0.30		
Post Test Mean	6.82	6.68	7.58	BG	7.04	2	3.52	20.18*	3.22
				WG	7.32	42	0.17		
Adjusted Post Test Mean	6.84	6.69	7.55	BG	6.03	2	3.01	17.82*	3.23
				WG	6.93	41	0.16		

***Significant at 0.05 level of confidence**

The table 2 reveals that the obtained 'F' values on pre-test, post-test and adjusted post-test mean of plyometric training group, mobility exercise group and control group.

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. Based on the results it was conformed that the mean differences among the groups of Plyometric training group and Mobility exercise group and control group, on speed before start of the respective treatments were found to be insignificant.

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. Since the observed F-value on post test means among the groups namely Plyometric training group and Mobility exercise group and control group on speed was highly significant as the value was higher than the required table value of 3.22. Thus the results obtained proved that the training on speed produced significantly improvements among the experimental groups.

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. Since the observed F-value on adjusted post test means among the groups namely Plyometric training group and Mobility exercise group and control group on speed 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 speed produced significantly improvements among the experimental groups.

In order to find out the paired mean difference for the significance of adjusted means was tested by Scheffe's post hoc test. The results of the same are presented in the table- 3

Table-3

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

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

***Significant at 0.05 level of confidence**

The table-3 shows the significant difference of paired adjusted post test means of Plyometric training group and Mobility exercise group, and control group on speed. 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 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 intravel value on speed, It was concluded that the mobility exercise group is better than the plyometric training group and control group.

The adjusted post mean values of Plyometric training group and Mobility exercise group and control group on Speed are graphically represented in the Figure-1

Figure-1

Cylinder Diagram Showing the Pre, Post and Adjusted Post Test Mean Values of Plyometric Training Group, Mobility Exercise Group and Control Group On Speed

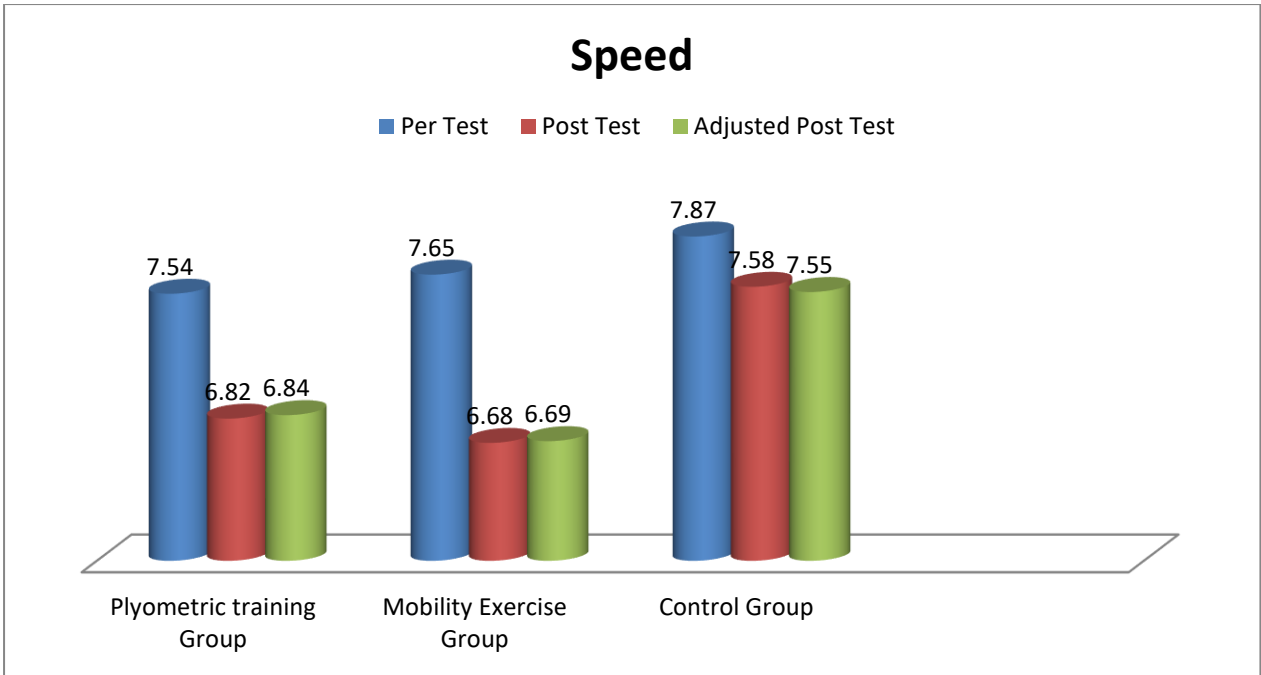


Table-4

Analysis of Covariance for the Pre, Post and Adjusted Post Test Means Values for Plyometric Training Group, Mobility Exercise Group and Control Group on Resting Heart Rate (PTG, MEG and CG)

Test	PTG	MEG	CG	Source of Variance	Sum of Squares	df	Mean Squares	F ratio	Table Value
Pre Test Mean	79.26	76.66	79.20	BG	1.91	2	0.95	0.24	3.22
				WG	166.66	42	3.96		
Post Test Mean	75.73	75.80	79.00	BG	104.57	2	52.28	10.10*	3.22
				WG	217.33	42	5.17		
Adjusted Post Test Mean	75.82	75.55	79.14	BG	119.36	2	59.68	24.15*	3.23
				WG	101.29	41	2.47		

***Significant at 0.05 level of confidence**

The table 4 showed that the obtained 'F' values on pre-test, post-test and adjusted post-test mean of plyometric training group, mobility exercise group and control group.

The pre-test means on Resting Heart Rate of plyometric training group, mobility exercise group and control group were 79.26, 76.66 and 79.20 respectively.

The 'F' value observed for the pre-test on Resting Heart Rate was 0.24. It fails to reach the table value of 3.22 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 groups of plyometric training group, mobility exercise group and control group, on Resting Heart Rate before start of the respective treatments were found to be insignificant.

The post-test means on agility of plyometric training group, mobility exercise group and control group were 75.73, 75.80 and 79.00 respectively.

The 'F' value observed for the post-test on Resting Heart Rate was 10.10. It was greater than the table value of 3.22 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 Resting Heart Rate was highly significant as the value was higher than the required table value of 3.22. Thus the results obtained proved that the training on Resting Heart Rate produced significantly improvements among the experimental groups.

The adjusted post-test means on agility of plyometric training group, mobility exercise group and control group were 75.82, 75.55 and 79.14 respectively.

The 'F' value observed for the adjusted post-test on Resting Heart Rate was 24.15 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 Resting Heart Rate 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 Resting Heart Rate produced significantly improvements among the experimental groups.

In order to find out the paired mean difference for the significance of adjusted means was tested by Scheffe's post hoc test. The results of the same are presented in table- 5

Table-5

The Scheffe's Test for the Difference between Paired Means on Resting Heart Rate

Means			Mean Difference	Required CI
PTG	MEG	CG		
75.82	----	79.14	3.32*	2.10
----	75.55	79.14	3.59*	2.10
75.82	75.55	----	0.27	2.10

***Significant at 0.05 level of confidence**

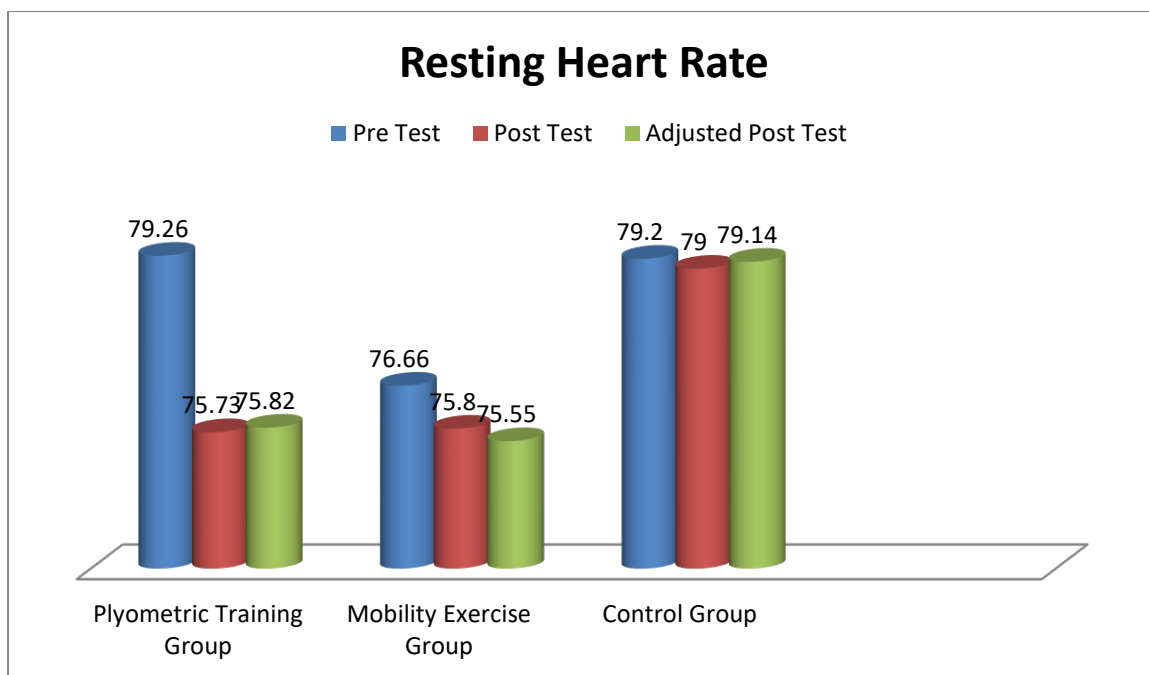
The table 5 shows that the significant difference of paired adjusted post test means of plyometric training group, mobility exercise group and control group on Resting Heart Rate. The obtained mean differences between plyometric training group and control group, mobility exercise group and control group and plyometric training group and mobility exercise group were 3.32, 3.59 and 0.27 respectively. The required confidence interval value was 2.10

Since the obtained mean differences between experimental groups and control group are greater than the obtained critical interval value on Resting Heart Rate, It was concluded that the plyometric training group, mobility exercise group and control group.

The adjusted post mean values of plyometric training group, mobility exercise group and control group on Resting Heart Rate are graphically represented in the Figure 4.6

Figure -2

Cylinder Diagram Showing the Pre, Post and Adjusted Post Test Mean Values of Plyometric Training Group, Mobility Exercise Group and Control Group on Resting Heart Rate



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 physical and physiological variables when compared to the control group.
2. The control group had not shown significant changes in any of the selected variables.
3. The Plyometric training and Mobility Exercise group has achieved significant positive improvement on physical variables among men Basketball players.
4. The Plyometric training and Mobility Exercise group has achieved significant positive improvement on physiological variables among men Basketball players.

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