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Effect of Plyometric Training and Circuit Training On Explosive Power Parameter Among College Men Athletes

KEYWORDS: Plyometric training, Circuit training, Explosive power and College men students.

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ABSTRACT *The purpose of the present study was to investigate the effect of Plyometric Training and Circuit Training on the arm explosive power and leg explosive power parameter of college men athletes. To achieve the purpose of the study forty five men players were selected from colleges affiliated to Madras University, during the year 2016-17. The subject's age ranges from 18 to 25 years. The selected players were divided into three equal groups consists of 15 men athletes each namely experimental group-I, experimental group-II and control group. The experimental group-I underwent Plyometric training and experimental group-II underwent Circuit training for six weeks. The control group was not taking part in any exercise during the course of the study. Arm explosive power was taken as criterion variables and they were tested by using 2kg medicine ball throw test for this study and leg explosive power was taken as criterion variables and they were tested by using standing broad jump test for this study .Pre-test was taken before the exercise period and post- test was measured immediately after the six week of training period. Statistical technique 'f' ratio was used to analyze the means of the pre-test and post test data of experimental groups and control group. The data were analyzed analysis of covariance (ANCOVA) technique was used with 0.05 levels as confidence. Analysis was performed using SPSS 20.0 (SPSS Inc Software). The results revealed that there was a significant difference found on the criterion variables. The difference found is due to Plyometric training and Circuit training given to the experimental groups on explosive power when compared to control group*

INTRODUCTION

Plyometric training is a sports training method that in based on the contractions of the body's muscles. This method has been proven to improve the athletic performance of athletes in a number of sports. This training style can help athletes improve their jumping ability, upper body strength, speed and agility. In Plyometric the lower body is generally trained using jump training while the upper body is trained with medicine ball exercises. Plyometric is a very effective training method as it helps the body to reach its maximum strength in the smallest amount of time possible. Athletes have discovered that the biggest improvements to their performance have been when they combine Plyometric training with weight training. Scientific studies have shown that by combining these two styles of training athletes are able to get the maximum gains towards their jumps, acceleration, power, strength and agility.

Circuit training is an effective and quick way to fit your workout into your busy day. Circuit training provides a high intensity cardio workout, along with resistance training. This is designed to target fat loss and lean muscle building. A Circuit is designed with a series of exercises performed in succession of each other. When one Circuit is complete you start the sequence over again with little to no break. To start you want to perform each exercise for 10 reps and 3 times through each Circuit. Remember to perform reps quickly and keep breaks as short as possible. The purpose of Circuit training is to keep moving, which pushes your body aerobically, while still challenging your strength. Circuit training can be an easy way to get a quick, total body workout. Circuits can be performed with little to no gym equipment, or at home. It is also an easy way to train with groups of people.

MATERIALS AND METHODS

The purpose of the present study was to investigate the effect of Plyometric Training and Circuit Training on the arm explosive power and leg explosive power parameter of college men athletes. The achieve this study was randomly selected forty five men athletes from Madras University affiliated college's student, during the year 2016-17 and their age ranged from 18 to 25 years. The subject was dived into three equal group's namely experimental group I, experimental group II and control group. The two experimental groups were undergone the experimental treatment for a period of six weeks of training so, the warming up exercise were given. The groups were given the following training, Plyometric training and circuit training.

Plyometric training group performed 10 drills namely bound, Hurdle hoping, Single leg hoping, Box jumps, Depth jumps, Power drop, Two legged hops, Incline push up, depth jump and Skipping. Circuit training group performed 10 drills namely Press-up, Prone Trunk Extensions, Reverse abdominal curl, Sit-ups, V sit ups,Skipping,Abdominal crunch, High Bench Step Up with Jumps, High knee sprints and Jumping. This Plyometric training group and circuit training group starts with 3 set of 12-10 repetitions in the first two weeks and progressed to 4 set of 10-8 repetitions in the second two weeks and 5 sets of 8-6 repetitions in the last two weeks. 30sec rest was given in between the sets. As the intensity start with 60% for first four weeks, 10% of intensity was increased for every two weeks. The subjects of all the three groups were tested on arm explosive power and leg explosive power prior to and after the training period.

To ascertain arm explosive power was used and accordingly 2kg medicine ball throw Test was administered mean value count by meters.

To ascertain muscular endurance was used and accordingly standing broad jump test was administered mean value

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count by meters.

Statistical Technique

The significance of the difference among the means of experimental group was found out by pre-test. The data were analyzed analysis of covariance (ANCOVA) technique was used with 0.05 levels as confidence. Analysis was performed using SPSS 20.0 (SPSS Inc Software).

RESULTS & INTERPRETATION

Table 1

Analysis of Covariance for the Pre, Post and Adjusted Post Test Means Values for Plyometric Training Group, Circuit Training Group and

Control Groups on Arm explosive power

(Over head medicine ball throws Mean value count by meters)

Test	Plyometric training group	Circuit training Group	Control Group	Source of Variance	Sum of Square	df	Mean Square	'F' ratio	Table value
Pre Test Mean	4.8327	4.8367	4.8353	Between	.001	2	.001	0.01	3.22
SD	.28	.309	.3181	Within	3.858	42	.092		
Post Test Mean	5.149	5.112	4.834	Between	.887	2	.443	4.86*	3.22
SD	.2334	.3321	.3298	Within	3.831	42	.091		
Adjusted Post Test Mean	5.151	5.111	4.834	Between	.891	2	.445	8.02*	3.21
				Within	2.277	41	.056		

*Significant at 0.05 level of confidence

The table I showed that the pre-test mean values on arm explosive power Plyometric training group, circuit training group and control group are 4.8327, 4.8367 and 4.8353 respectively. The obtained 'F' ratio 0.01 for pre-test mean was less than the table value 3.22 for df 2 and 42 required for significance at 0.05 level of confidence on arm explosive power. The post-test mean values on arm explosive power of Plyometric training group, circuit training group and control group are 5.149, 5.112 and 4.834 respectively. The obtained 'F' ratio 4.86* for post-test mean was greater than the table value 3.22 for df 2 and 42 required for significance at 0.05 level of confidence on arm explosive power . The adjusted post-test means of Plyometric training group, circuit training group and control group are 5.151, 5.111 and 4.834 respectively. The obtained 'F' ratio 8.02 for adjusted post-test mean was greater than the table value 3.23 for df 2 and 41 required for significance at 0.05 level of confidence on arm explosive power. Since the obtained 'F' ratio value was significant further to find out the paired mean difference, the Scheffe's post hoc test was employed and presented in table- II

Table-II

The Scheffe's Test for the Difference between

Paired Means on Arm explosive power

(Over head medicine balls throw Mean value count by meters)

Means			Mean Difference	Required CI
Plyometric Training	Circuit Training	Control Group		
5.151	5.111	-	0.04	0.22
5.151	-	4.834	0.317	0.22
-	5.111	4.834	0.277	0.22

*Significant at 0.05 level of confidence

The table II shows that the adjusted post-test mean difference in arm explosive power between Plyometric training group and control training group is 0.317 it is significant at 0.05 level of confidence and proved there was a significant improvement. Circuit training group and control group is 0.277 it is significant at 0.05 level of confidence and proved there was a significant improvement. Circuit training group and control group is 0.277 it is significant at 0.05 level of confidence and proved there was a significant improvement. Hence, there was significant difference between control and experimental groups in arm explosive power among college men students. However, the mean difference between the two experimental groups was 0.04 which was not significant at 0.05 level of confidence. It may be concluded from the results that there was no significant difference between adjusted post means of Plyometric training group, Circuit training group. Statistically significant difference existed between the Plyometric training group and control group. The results of the study showed that there were a significant difference between circuit training group and control group, Plyometric training group and control group on arm explosive power.

Table III

Analysis of Covariance for the Pre, Post and Adjusted Post Test Means Values for Plyometric Training Group, Circuit Training Group and

Control Groups on Leg explosive power

(Standing broad jump Mean value count by meters)

Test	Plyometric training group	Circuit training Group	Control Group	Source of Variance	Sum of Square	Df	Mean Square	'F' ratio	Table value
Pre Test Mean	2.1187	2.104	2.1153	Between	.002	2	.001	.035	3.22
SD	.1345	.1719	.1652	Within	1.052	42	.025		
Post Test Mean	2.2613	2.24	2.092	Between	.253	2	.127	4.59*	3.22
SD	.1616	.1548	.1805	Within	1.158	42	.028		

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Adjusted Post Test Mean	2.255	2.248	2.090	Between	.262	2	.131	33.13*	3.21
				Within	.162	41	.004		

*Significant at 0.05 level of confidence

The table III showed that the pre-test mean values on leg explosive power Plyometric training group, circuit training group and control group are 2.118, 2.104 and 2.115 respectively. The obtained 'F' ratio 0.35 for pre-test mean was less than the table value 3.22 for df 2 and 42 required for significance at 0.05 level of confidence on arm explosive power. The post-test mean values on leg explosive power of Plyometric training group, circuit training group and control group are 2.2613, 2.24 and 2.092 respectively. The obtained 'F' ratio 4.59* for post-test mean was greater than the table value 3.22 for df 2 and 42 required for significance at 0.05 level of confidence on leg explosive power . The adjusted post-test means of Plyometric training group, circuit training group and control group are 2.255, 2.248 and 2.090 respectively. The obtained 'F' ratio 33.13* for adjusted post-test mean was greater than the table value 3.23 for df 2 and 41 required for significance at 0.05 level of confidence on leg explosive power. Since the obtained 'F' ratio value was significant further to find out the paired mean difference, the Scheffe's post hoc test was employed and presented in table- IV

Table-IV

The Scheffe's Test for the Difference between

Paired Means on Leg explosive power

(Standing broad jump Mean value count by meters)

Means			Mean Difference	Required CI
Plyometric Training	Circuit Training	Control Group		
2.255	2.248	-	0.007	0.06
2.255	-	2.090	0.165	0.06
-	2.248	2.090	0.158	0.06

*Significant at 0.05 level of confidence

The table IV shows that the adjusted post-test mean difference in leg explosive power between Plyometric training group and control training group is 0.317 it is significant at 0.05 level of confidence and proved there was a significant improvement. Circuit training group and control group is 0.277 it is significant at 0.05 level of confidence and proved there was a significant improvement. Circuit training group and control group is 0.277 it is significant at 0.05 level of confidence and proved there was a significant improvement. Hence, there was significant difference between control and experimental groups in leg explosive power among college men students. However, the mean difference between the two experimental groups was 0.04 which was not significant at 0.05 level of confidence. It may be concluded from the results that there was no significant difference between adjusted post means of Plyometric training group, Circuit training group. Statistically significant difference existed between the Plyometric training group and control group. The results of the study showed that there were a significant difference between circuit training group and control group, Plyometric training group and control group on leg explosive power.

DISCUSSION OF FINDING

The investigator was convinced with the results that the group training in arm explosive power and leg explosive power with the Plyometric training and circuit training improve both explosive powers. The training given to the experimental group with Plyometric training and circuit training had an influence on the experimental group and had shown improvement in both explosive powers than the control group in the final test. The training given to the experimental group was planned by the investigator in consultation with his guide and with great care. The investigator felt that anyone could become good athletes if he has good explosive power.

CONCLUSION

There was a significant improvement in arm and leg explosive power on Athletes. However the improvement was in favour for experimental groups namely Plyometric training and circuit training compare better than the control group due to six weeks of training programme.

However the improvement was in favour for experimental groups namely Plyometric training compare better than the circuit training and control group due to six weeks of training programme.

However the improvement was in favour for experimental groups namely Circuit training compare better than the control group due to six weeks of training programme.

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