

# **EFFECTS OF CIRCUIT TRAINING ON MOTOR ABILITY OF ATHLETICS PLAYERS OF VISAKHAPATNAM CITY**

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## **ABSTRACT**

These days, a physically fit body, free from ailments of any kind, is believed to be one of the most important assets that a human being can possess. The importance of physical fitness and exercise, customized to the specific requirements of both young and old, has led to the popularity and use of exercise equipment. The easy access to gyms and fitness centers further highlights the importance of physical fitness. This has resulted in people leading longer and healthier lives that their predecessors could not have dreamed of. The purpose of the study was to determine the effects of Circuit Training on Motor Ability of Athletics Players of Visakhapatnam city. The objective of the study was to study compare the effects of circuit training of experimental group and control group. The objective of the study was to compare the changes in physical fitness components of the Athletics players of Circuit Training Group and Control Group. It was hypothesized that there would be significant effects of circuit training on motor fitness variables in Athletics players of Visakhapatnam City. This study may be beneficial in exploring the significance of circuit training on motor fitness components among Athletics player of Visakhapatnam City.

## **INTRODUCTION**

Fitness training also helps in increasing the metabolism of the body, which means more muscles using more calories in body. The training helps increase fit muscles in body, by burning the calories. After the body grows senile, the body loses its muscles and the metabolism of the body slows down gradually, which means the calories of the body is not burnt and get concentrated which results in increasing the weight of the body. So to keep the metabolism from slowing down and not letting the fat concentrate in the body one can opt for some fitness training and take some aerobic activities. It also helps in reducing symptoms of menopause, cardiac diseases and keeps the level of cholesterol in control. And in all it gives the body a much toned shape, which not only looks strong but is stronger than what it looks like.

Circuit Training is an everlasting and evolving training exercise programme developed by R. E. Morgan and G. T. Anderson in 1953 at the University of Leeds, England. Circuit Training was developed to allow people to work at their own intensity while also training with others. In the original format, a circuit would comprise of 9 to 12 stations. A participant would move from one station to the next with little rest and performing an exercise for a set period of time or number of repetitions. During the circuit training session all the energy systems interweave to enable different intensity activities to be performed. This will result in the aerobic energy system being more predominant during some exercises and the anaerobic energy system will be more predominant in other exercises.

### **Selection of Subjects**

A total of 100 male Athletics players of Visakhapatnam City were selected for the purpose of the study. The age group was between 16 to 19 years. Before executing the tests, the subjects were taken into the laboratory and were made understand the aim of these tests. For the conduction of the tests the services of the expert physical education lecturers was taken. The subjects were equally divided into two groups. One group was Circuit Training group and second group was Control Group.

### **Selection of Variables**

For this study the following Motor Fitness Components were taken:

1. Muscular Strength
2. Muscular Endurance
3. Speed and Agility
4. Explosive strength
5. Speed and Explosive strength
6. Cardiovascular Efficiency

### **AAPHER test**

AAPHER test a standard means to test the Physical fitness of the Athletics' players for the study and best efficiency of the tester and with the help of the guide and other physical fitness trainers and coaches of the Athletics' game was taken to gather the data for the study which was authenticate and credible.

AAPHER Physical fitness test was applied for this study. The ability of the tester was linked with the credibility of the test under equal and ideal circumstances test which was held with due intervals under the observation of the guide and the field experts.

### **Planning of Training Program**

First of all the Athletics' players which were to be given the training were made understand about the circuit training and all the exercise included in this test. Schedule of the training program on which days the program will be going to take place. The time for the circuit training was made for 10 weeks continuous. In a week Sunday was

kept as rest for the subjects to make them relax. The time of training was fixed for 45 minutes which included of 10 minutes of warming up, 25 minutes of circuit training and 10 minutes of cooling down exercise. Circuit training was given to the students in morning session starting from 6.30 AM.

### **Analysis of Data**

Data collected with the help of Motor Fitness Test was transformed into standard score, data process was done through T Ratio and the mean of this data and the different of mean was analyzed.

The aim of this study was to determine the effects of Circuit Training on Motor Ability of Athletics Players of Visakhapatnam city. A total of 100 male Athletics players of Visakhapatnam City were selected for the purpose of the study. The age group was between 16 to 19 years. The subjects were equally divided into two groups. One group was Circuit Training group and second group was Control Group. For circuit training group a 10 weeks of training program was formed and training was imparted to the circuit training group from Monday to Saturday in morning session from 6.30 to 7.15 AM for 45 minutes. Sunday rest was given to experimental group subjects.

Before starting of circuit training for 10 weeks on experimental group and at the end of the training period, Pre and Post test was conducted on the circuit training group and control group of AAHPER Physical Fitness test. Pre test and Post test data was collected and statistical analysis for the study was done on the data collected. The level of significance chosen to study the significance of difference between means obtained by using mean difference method and analysis of variance was set at 0.05% level of confidence, which is considered adequate for the purpose of the study.

**Table- 1 shows difference of Pre-Test and Post-Test Mean and 't' ratio of Pull-Up test**

Group	Pre Test Mean	Post Test Mean	Mean Difference	Std. Deviation	't' Ratio
Circuit Training	10.08	11.00	0.92	0.396	-16.432
Control	10.04	9.40	-0.64	0.802	5.642

Table value t of 1.98 (2.57) degree of freedom at level 0.05

Table-1 indicates that in Circuit Training Group, Pre Test Mean was found 10.08 and Post Test Mean was found 11.00. While mean difference was -0.92 and Standard Deviation was 0.396. Calculated "t" ratio of Circuit Training Group was-16.432, which was significant when compared with table value "t" 2.57. Control Group Pre Test Mean was found 10.04 and Post Test Mean was 9.40. While mean difference was -0.64 and Standard Deviation was 0.802. Calculated "t" ratio was 5.642 which was significant when compared with table value T 2.57. From above table it was discovered that Pre Test and Post Test of the Circuit Training Group was found significant in comparison to Pre Test and Post Test of Control Group.

**Table 2 shows difference of Pre-Test and Post-Test Mean and 't' ratio of Sit-Up test**

Group	Pre Test Mean	Post Test Mean	Mean Difference	Std. Deviation	't' Ratio
Circuit Training	22.84	25.84	-3.00	2.176	-9.749
Control	19.84	21.00	-1.06	2.368	-3.165

Table value t of 1.98 (2.57) degree of freedom at level 0.05

Table-2 indicates that in Circuit Training Group, Pre Test Mean was found 22.84 and Post Test Mean was found 25.84. While mean difference was -3.00 and Standard Deviation was 2.176. Calculated "t" ratio of Circuit Training Group was-9.749, which was significant when compared with table value "t" 2.57 Control Group Pre Test Mean was found 19.84 and Post Test Mean was 21.00. While mean difference was -1.06 and Standard Deviation was 2.368. Calculated "t" ratio was -3.165 which was significant when compared with table value "t" 2.57. From above

table it was discovered that Pre Test and Post Test of the Circuit Training Group was found significant in comparison to Pre Test and Post Test of Control Group.

**Table 3 shows difference of Pre-Test and Post-Test Mean and 't' ratio of Shuttle Run test**

Group	Pre Test Mean	Post Test Mean	Mean Difference	Std. Deviation	't' Ratio
Circuit Training	12.38	12.67	-0.29	0.175	-11.839
Control	11.32	11.38	-0.06	0.217	-2.056

Table value t of 1.98 (2.57) degree of freedom at level 0.05

Table-3 indicates that in Circuit Training Group, Pre Test Mean was found 12.38 and Post Test Mean was found 12.67 While mean difference was -0.29 and Standard Deviation was 0.175. Calculated "t" ratio of Circuit Training Group was-11.839, which was significant when compared with table value t 2 57 Control Group Pre Test Mean was found 11.32 and Post Test Mean was 11.38. While mean difference was -0.06 and Standard Deviation was 0.217. Calculated "t" ratio was-2.056 which was found not significant when compared with table value "t" 2.57. From above table it was discovered that Pre Test and Post Test of the Circuit Training Group was found significant in comparison to Pre Test and Post Test of Control Group.

**Table 4 shows difference of Pre-Test and Post-Test Mean and 't' ratio of Standing Broad Jump test**

Group	Pre Test Mean	Post Test Mean	Mean Difference	Std. Deviation	't' Ratio
Circuit Training	1.80	2.03	-0.23	0.125	-13.230
Control	1.77	1.93	-0.16	0.162	-6.802

Table value t of 1.98 (2.57) degree of freedom at level 0.05

Table-4 indicates that in Circuit Training Group, Pre Test Mean was found 1.80 and Post Test Mean was found 2.03. While mean difference was -0.23 and Standard Deviation was 0.125. Calculated "t" ratio of Circuit Training Group

was -13.230, which was significant when compared with table value “t” 2.57, Control Group Pre Test Mean was found 1.77 and Post Test Mean was 1.93. While mean difference was -0.16 and Standard Deviation was 0.162. Calculated “t” ratio was -6.802 which was significant when compared with table value “t” 2.57. From above table it was discovered that Pre Test and Post Test of the Circuit Training Group was found significant “tn” comparison to Pre Test and Post Test of Control Group.

**Table 5 shows difference of Pre-Test and Post-Test Mean and 't' ratio of 50 Yard Dash test**

Group	Pre Test Mean	Post Test Mean	Mean Difference	Std. Deviation	't' Ratio
Circuit Training	7.68	9.12	-1.44	1.161	- 8.753
Control	8.28	8.82	-0.54	1.159	- 3.259

Table value t of 1.98 (2.57) degree of freedom at level 0.05

Table-5 indicates that in Circuit Training Group, Pre Test Mean was found 7.86 and Post Test Mean was found 9.12. While mean difference was -1.44 and Standard Deviation was 1.161. Calculated T ratio of Circuit Training Group was -8.753, which was significant when compared with table value T 2.57. Control Group Pre Test Mean was found 8.28 and Post Test Mean was 8.82. While mean difference was -0.54 and Standard Deviation was 1.159. Calculated T ratio was -3.259 which was significant when compared with table value “f” 2.57. From above table it was discovered that Pre Test and Post Test of the Circuit Training Group was found significant in comparison to Pre Test and Post Test of Control Group.

**Table 6 shows difference of Pre-Test and Post-Test Mean and 't' ratio of 600 Yard Race**

Group	Pre Test Mean	Post Test Mean	Mean Difference	Std. Deviation	't' Ratio
Circuit Training	1546.00	1559.60	-13.60	10.402	- 9.245
Control	1506.60	1458.10	48.50	88.802	3.862

Table value t of 1.98 (2.57) degree of freedom at level 0.05

Table-6 indicates that in Circuit Training Group, Pre Test Mean was found 1546.00 and Post Test Mean was found 1559.60. While mean difference was -13.60 and Standard Deviation was 10.402. Calculated “t” ratio of Circuit Training Group was -9.245, which was significant when compared with table value t 2.57. Control Group Pre Test Mean was found 1506.60 and Post Test Mean was 1458.10. While mean difference was 48.50 and standard Deviation was 88.802. Calculated T ratio was 3.862 which was significant when compared with table value “f” 2.57. From above table it was discovered that Pre Test and Post Test of the Circuit Training Group was found significant in comparison to Pre Test and Post Test of Control Group.

### Discussion of Findings

#### 1. Pull-Up Test

Statistical analysis shows that, Circuit Training Group Calculated “t” ratio was -16.432, which was significant when compared with table value “t” 2.67. Control Group Calculated “t” ratio was 5.642 which was significant. It proves that there is positive significant difference in muscular strength (Pull-Ups) between Circuit Training Group and Control Group. It was also found that Circuit Training Group’s Muscular Strength efficiency of Pull-ups was more than Control Group.

#### 2. Sit-Ups Test

Statistical analysis shows that, calculated “t” ratio of Circuit Training Group was -9.749, which was significant when compared with table value “t” 2.57. Control Group calculated “t” ratio was -3.165 which was significant. It proves that there is negative significant difference in endurance strength (Sit-Ups) between Circuit Training Group and Control Group. It was also found that Circuit Training Group’s Endurance Strength efficiency of Sit-ups was more than Control Group.

#### 3. Shuttle Run Test

Statistical analysis shows that, Calculated “t” ratio of Circuit Training Group was -11.839, which was significant when compared

with table value "t" 2.57. Control Group calculated "t" ratio was -2.056 which was not significant. It proves that there is positive significant difference in Speed and Agility Strength (Shuttle Run) between Circuit Training Group and Control Group. It was also found that Circuit Training Group's Speed and Agility Strength efficiency of Shuttle Run was more than Control Group.

#### 4. Standing Broad Jump Test

Statistical analysis shows that, calculated "t" ratio of Circuit Training Group was -13.230, which was significant when compared with table value "t" 2.57. Control Group calculated "t" ratio was -6.802 which was significant. It proves that there is negative significant difference in Leg Muscular Strength (Standing Broad Jump) between Circuit Training Group and Control Group. It was also found that Circuit Training Group's Leg Muscular Strength efficiency of Standing Broad Jump was more than Control Group.

#### 5. 50 Yard Dash Test

Statistical analysis shows that, calculated "t" ratio of Circuit Training Group was -8.753, which was significant when compared with table value "t" 2.57. Control calculated "t" ratio was -3.259 which was significant. It proves that there is negative significant difference in Speed Strength (50 Yard Dash) between Circuit Training Group and Control Group. It was also found that Circuit Training Group's Speed Strength efficiency of 50 Yard Run was more than Control Group.

#### 6. 600 Yard Race Test

Statistical analysis shows that, calculated "t" ratio of Circuit Training Group was -9.245, which was significant when compared with table value "t" 2.57. Control Group calculated "t" ratio was 3.862 which was significant. It proves that there is negative significant difference in Cardiovascular Efficiency Strength (12 Minutes Run / Walk) between Circuit Training Group and Control Group. It was also found that Circuit Training Group's Cardiovascular Efficiency Strength efficiency

of 1600 Yard Race was more than Control Group.

The hypothesis i.e., there would be significant effects of circuit training on motor fitness variables in Athletics players of Visakhapatnam City was accepted. Statistical Analysis showed that there was significant difference in AAHPER Physical Fitness Variables in Circuit Training Group and Control Group.

### Conclusion

After analyzing the data it was found significant at 0.05 level of significance. The following conclusions were drawn with in the limitations of this study at the end of 10 week training program.

1. Statistical analysis showed that Circuit Training group athletics players Muscular Strength efficiency of Pull-ups is more than Control Group athletics players.

2. Circuit Training group athletics players Endurance Strength efficiency of Sit-ups is more than Control Group athletics players.

3. Circuit Training group athletics players Speed and Agility Strength efficiency of Shuttle Run is more than Control Group athletics players.

4. Circuit Training group athletics players Leg Muscular Strength efficiency of Standing Broad Jump is more than Control Group athletics players.

5. Circuit Training group athletics players Speed Strength efficiency of 50 Yard Dash is more than Control Group athletics players.

6. Circuit Training group athletics players cardiovascular efficiency of 600 Yard Race is more than Control Group athletics players.

### Recommendation

Study can be conducted by selecting the subjects of different age group. A study can be conducted selecting players of different games. This type of study can be conducted by increasing the number of subjects and the time of training. This type of study can be conducted by selecting the subjects from different geographical areas of India. The study can also be conducted selecting special

aspects of physiological and anthropometric and training them in different weather conditions.

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