

**INFLUENCE OF CIRCUIT TRAINING ON SELECTED PHYSICAL FITNESS VARIABLES AMONG COLLEGE LEVEL MEN VOLLEYBALL PLAYERS****Dr. S. Saraboji<sup>1</sup> Dr.Sathuluri Raju<sup>2</sup> Dr.B.Krishna Deepika<sup>3</sup>**

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**DOI : 10.48047/IJFANS/V10/ISS1/065****Abstract:**

Circuit training is a time-efficient exercise modality that can elicit demonstrable improvements in health and physical fitness. Health related physical fitness is indispensable for every person irrespective of age . Profession and gender to lead a healthy life. One of the key components of health related physical fitness is muscular endurance. The main objective of this very study was to determine influence of circuit training on selected physical fitness variables among college level men volleyball players Sport is a valid physical activity, therefore, given the criteria of increasing its levels for the purpose of improving health; it can be adapted and modified to take into account the target population group. Sports developers have been aware of this for decades as they work at grassroots level across communities from different sectors in society; and have managed to work with the complexity of sport and health promotion. Its simplicity, however, has contributed to the misunderstanding that sporting excellence is at the pinnacle of participation, which can alienate the health-related participant. It is also not compatible with sport can reduce health inequalities; particularly as elite sport carries its own issues of health. Games and sports have crossed many mile stones in the universe. Now a day's performance oriented scientific investigation has been tremendously increased to enhance the performance of sportsman. These kinds of performances are being attained due to the scientific investigation's biomechanical analysis, sport nutrition with the help of exercise physiology and sports psychology etc. With all these allied sciences the excellence in sports performance came into existence. The Purpose of this study was to find out the influence of circuit training on selected physical fitness Variables among College level men volleyball players. The subjects were Volleyball players from East Godavari District, Andhra Pradesh. The subjects were randomly divided into three equal groups men volleyball players. Both the experimental groups and control group (CG). The physical fitness variables namely Abdominal muscular endurance and flexibility variables of the study. underwent the respective experimental trainings for a period of eight (8) weeks and the

control group did not undergo any special training programme apart from their regular routine. The selected subjects were randomly segregated into three equal groups namely, circuit training group (CTG), physical fitness group (PFG) and control group (CG). Circuit training variables namely abdominal muscular strength endurance and physical fitness variables namely flexibility variables of the study. Based on the findings and within the limitations imposed by the experimental conditions the following conclusions were drawn. The Circuit training is an effective training module to improve significantly on the circuit training variables namely abdomen muscular endurance and physical fitness variable namely flexibility of college level men volleyball players.

**Keyword :** Flexibility and Abdominal muscular strength endurance .

### **Introduction**

Circuit training is a time-efficient exercise modality that can elicit demonstrable improvements in health and physical fitness. Health related physical fitness is indispensable for every person irrespective of age . Profession and gender to lead a healthy life. One of the key components of health related physical fitness is muscular endurance. The main objective of this very study was to determine influence of circuit training on selected physical fitness variables among college level men volleyball players Sport is a valid physical activity, therefore, given the criteria of increasing its levels for the purpose of improving health; it can be adapted and modified to take into account the target population group. Sports developers have been aware of this for decades as they work at grassroots level across communities from different sectors in society; and have managed to work with the complexity of sport and health promotion. Its simplicity, however, has contributed to the misunderstanding that sporting excellence is at the pinnacle of participation, which can alienate the health-related participant. It is also not compatible with sport can reduce health inequalities; particularly as elite sport carries its own issues of health.

### **Methodology**

The Purpose of this study was to find out the influence of circuit training on selected physical fitness variables among college level men volleyball players. To selected thirty-six (36) College level men from East Godavari District, Andhra Pradesh. The subjects were randomly divided into three equal groups men volleyball players. Both the experimental groups and control group (CG). The circuit training group variables namely Abdominal muscular strength endurance and physical fitness group variables namely flexibility variables of the study. underwent the respective experimental trainings for a period of eight (8) weeks and the control group did not undergo any special training programme apart from their regular routine. The selected subjects were randomly segregated into three equal groups namely, circuit training

group (CTG), physical fitness group (PFG) and control group (CG). Circuit training variables namely Flexibility and Abdominal muscular strength endurance. variables namely Abdominal muscular strength endurance and physical fitness variables namely flexibility variables of the study.

### Training procedure

The subjects were given enough orientation on the training programme to be given by the investigator. The investigator selected thirty-six college level men volleyball players from East Godavari District, Andhra Pradesh. Their age was ranged from 17 to 23 years. The selected subjects were divided in to three equal groups with 12 subjects each namely two experimental groups and one control group. Experimental groups underwent Circuit training and physical fitness training programmes for a period of 8 weeks on five days per week. Each training session was for an hour. Control group did not undergo any treatment.

### Statistical Techniques

The collected data was analysed with application of 't' test to find out the individual effect from pre to post-tests if any. Further Analysis of Covariance (ANCOVA) was used to determine the significant difference among the treatment means and control group. Whenever the 'F' ratio was found to be significant, pairwise comparison was applied to test the significant difference between the paired adjusted post-test means. The level of confidence was fixed at 0.05 level for all the variables to test the level of significance. It was considered as sufficient for the present study.

### Results and Discussion

#### Results on flexibility

The performance related fitness variable namely flexibility was measured through sit and reach test. The results on the efficacy of Circuit training, physical fitness training and control groups are presented in table I.

**TABLE I**  
**COMPUTATION OF ANALYSIS OF COVARIANCE ON FLEXIBILITY**

Test	Means			Sum of Variance	Sum of Square	Mean Square	F	'p' Value
	CTG	(PFTG) (PFTG)	CG					
Pre	30.81	30.91	30.08	B	4.87	2.43	0.74	0.48
				W	108.24	3.28		
				B	278.02	139.01		

<b>Post</b>	36.11	36.34	30.33	<b>W</b>	64.67	1.96	70.94*	0.01
<b>Adjusted Post</b>				<b>B</b>	223.34	111.67		
	35.98	36.15	30.66	<b>W</b>	20.79	0.65	171.88*	0.01
<b>Mean Gain</b>	5.30	5.43	0.25					

\*Significant difference at 0.05 level of confidence

Table -I shows that the pre-test mean of flexibility of circuit training group (CTG) was 30.81, Physical fitness training group (PFTG) was 30.91 and control group (CG) was 30.08. The post-test analysis proved that there was a significant difference among the groups, as they obtained 'p' value 0.01 was lesser than the required 'p' value of 0.05. This was proved that there were significant differences among the post- test means of all the groups. Taking into consideration of the pre and post-test among the groups, the adjusted post-test were calculated and subjected to statistical treatment. The obtained 'p' value of 0.01 was lesser than the required 'p' value of 0.05. This proved that there were significant differences among the means of experimental groups due to the respective experimental trainings on flexibility. Since the significant differences were recorded, the results were subjected to pair wise comparison among the groups. The results are presented in table II.

**TABLE II**

Paired Mean Significant Difference on Flexibility The obtained 'p' value on pre-test 0.48 was greater than the required 'p' value of 0.05 to be significant at 0.05 levels. This proved that there were no significant differences among the experimental and control groups indicating that the process of randomization of the groups was perfect while assigning subjects to groups.

Adjusted Post Test Means				Mean Difference	'p' Value
Circuit Training Group	Physical Training Group	fitness Control Group	Control Group		
-	36.15		30.66	5.48*	0.01
35.98	-		30.66	5.31*	0.01
35.98	36.15		-	0.17	0.61

The above table II clearly indicates that the paired mean significant difference on the level of flexibility among experimental and control groups. And the variation in flexibility among the experimental and control groups were found to be significant difference between the paired means of circuit training and control group and Physical fitness training and control groups. However, there was no significant difference found between the paired means of Circuit

training and Physical fitness training groups on flexibility.

### Discussion on Findings of Flexibility

Obtained adjusted post-test means on flexibility of circuit training group (CTG) was 35.98, Physical fitness training group (PFTG) was 36.15 and control group (CG) was 30.66. training means in improving the flexibility than the other training means. While testing the isolated efficacy of Circuit training group (CTG) and Physical fitness training group (PFTG) each one had significantly improved the flexibility of college men volleyball players. Whereas the control group was concerned the observed mean difference from base line to post test was not differ significantly. Hence it is clearly understood that the selected training means had influenced significantly to increase the flexibility.

The results of this investigation are in consonance with the study done by **Anand Wankhede & Manoj Painjane (2020)** and **Muniraju et al., (2017)** and The differences among pre-test, post-test and adjusted post-test mean of the subjects were statistically treated by using ANCOVA and the 'p' values obtained were 0.48, 0.01 and 0.01 respectively. Since the obtained 'p' values were lesser than the 'p' value of 0.05 it was found that the flexibility of post-test and adjusted post-test means were differ significantly. Circuit training (CTG = 17.20%), Physical fitness training (PFTG = 17.57%) would be effective in causing significant improvement among experimental groups on flexibility. And also, when comparing the adjusted post- test mean values of flexibility the Physical fitness training means had most effective concluded that the circuit training and Physical fitness training significantly improved the flexibility.

### Results on abdominal Muscular Strength Endurance

The performance related fitness variable namely abdominal muscular strength endurance was measured through sit ups. The results on the efficacy of Circuit training, Physical fitness training and control groups are presented in table III.

**TABLE -III**  
**COMPUTATION OF ANALYSIS OF COVARIANCE ON ABDOMINAL MUSCULAR STRENGTH ENDURANCE**

Test	Means			Sum of variance	Sum of Square	Mean Square	F	'p' Value
	(CTG)	(PTG)	Control Group					
Pre	27.67	27.00	27.67	B	3.56	1.78	0.30	0.75
				W	197.33	5.98		
Post	34.08	32.67	27.92	B	250.39	125.19	16.49*	0.01

				<b>W</b>	250.50	7.59		
<b>Adjusted Post</b>	33.89	33.06	27.72	<b>B</b>	267.99	133.10	43.39*	0.01
				<b>W</b>	98.83	3.09		
<b>Mean Gain</b>	6.41	5.67	0.25					

Table -III shows that the pre-test means of abdominal muscular strength endurance of Circuit training group (CTG) was 27.67, Physical fitness training group (PFTG) was 27.00 and control group (CG) was 27.67. The obtained 'p' value on pre-test 0.75 was greater than the required 'p' value of 0.05 to be significant at 0.05 levels. This proved that there were significant differences among the experimental and control groups indicating that the process of randomization of the groups was perfect while assigning subjects to groups. The post-test analysis proved that there was a significant difference among the groups, as the obtained 'p' value 0.01 was lesser than the required 'p' value of 0.05. This was proved that there were significant differences among the post-test means of all the groups. Taking into consideration of the pre and post-test among the groups, the adjusted post-test were calculated and subjected to statistical treatment. The obtained 'p' value of 0.01 was lesser than the required 'p' value of 0.05. This proved that there were significant differences among the means of experimental groups due to the respective experimental trainings on abdominal muscular strength endurance. Since the significant differences were recorded, the results were subjected to pair wise comparison among the groups. The results are presented in table -IV.

TABLE -IV

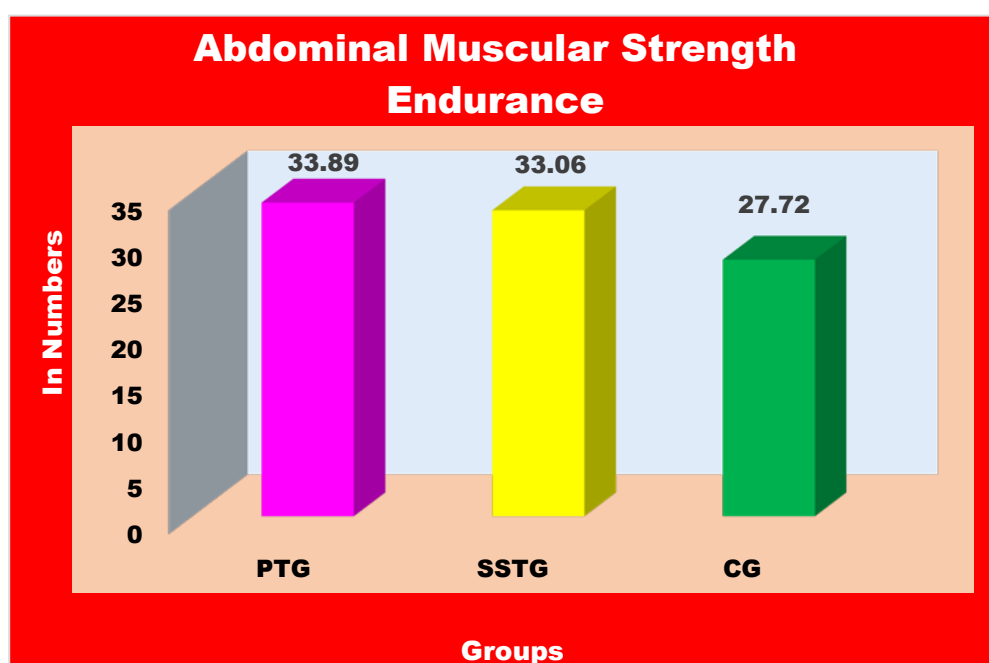
**PAIRED MEAN SIGNIFICANT DIFFERENCE ON ABDOMINAL MUSCULAR STRENGTH ENDURANCE**

Adjusted Post Test Means				Mean Difference	'p' Value
Circuit Training Group	Physical Training Group	Fitness Training Group	Control Group		
-	33.06	-	27.72	5.33*	0.01
33.89	-	-	27.72	6.17*	0.01
33.89	33.06	-	-	0.83	0.26

The above table-IV clearly indicates that the paired mean significant difference on the level of abdominal muscular strength endurance among experimental and control groups. And the variation in abdominal muscular strength endurance among the experimental and control groups were found to be significant difference between the paired means of Circuit training and control groups and Physical fitness training and control groups. However, there was no significant

difference found between the paired means of Circuit training and Physical fitness training groups on abdominal muscular strength endurance.

**BAR DIAGRAM SHOWS THE ADJUSTED POST-TEST MEANS OF ABDOMINAL MUSCULAR STRENGTH ENDURANCE OF EXPERIMENTAL AND CONTROL GROUPS**



**Discussion on findings of abdominal muscular strength endurance**

The results presented in the table I showed that obtained adjusted post-test means on abdominal muscular strength endurance of Circuit training group (CTG) was 33.89, Physical fitness training group (PFTG) was 33.06 and control group (CG) was 27.72.

The differences among pre-test, post-test and adjusted post-test mean of the subjects were statistically treated by using ANCOVA and the 'p' values obtained were 0.75, 0.01 and 0.01 respectively. Since the obtained 'p' values were lesser than the 'p' value of 0.05 it was found that the abdominal muscular strength endurance of post-test and adjusted post-test means were differ significantly. Circuit training (CTG = 23.20%), Physical fitness training (PFTG = 21%) training would be effective incusing significant improvement among experimental groups on abdominal muscular strength endurance. And also, when comparing the adjusted post-test mean values of abdominal muscular strength endurance the Circuit training means had most effective training means in improving the abdominal muscular strength endurance than the other training means. While testing the efficacy of Circuit training group (CTG) and Physical fitness training

group (PFTG) each one had significantly improved the abdominal muscular strength endurance of college level men volleyball players. Whereas the control group was concerned the observed mean difference from base line to post test was not differ significantly. Hence it is clearly understood that the selected training means had influenced significantly to increase the abdominal muscular strength endurance. The results of this investigation are in consonance with the study done by **Jayavant Shimpi (2020)** and concluded that the circuit training and physical fitness training significantly improved the abdominal muscular strength endurance.

### Conclusions

Based on the findings and within the limitations imposed by the experimental conditions the following conclusions were drawn. The Circuit training is an effective training module to improve significantly on the circuit training variables namely abdomen muscular endurance and physical fitness variable namely flexibility of college level men volleyball players. The Circuit training is an effective training module to improve significantly on the circuit training variables namely Abdomen muscular endurance and Physical fitness training variables namely flexibility of college level men volleyball players.

The control group showed no significant improvement on all the selected physical fitness variables, hence the improvement of the experimental groups was due to the respective experimental training alone. There were significant difference among the experimental and control groups on the selected dependent variables due to the eight weeks of Circuit training and physical fitness training of college level men volleyball players.

While comparing the effect of Circuit training and Physical fitness training the Circuit training had produced better improvement in Abdomen muscular endurance than the other training. The Physical fitness training had produced better improvement Flexibility then the Circuit training.

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