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## Effect of circuit training on physical fitness components of men basketball players

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### Abstract

The purpose of the study was to investigate the effect of circuit training on selected physical fitness variables of basketball players. Thirty out of players were randomly selected from Bharathiar University, Coimbatore the selected players were divided into two groups consisting of 15 players. No attempt was made equate the groups. The age of the subjects ranged between 20 to 25 years. The influence of the circuit training was assessed on selected variables. The training load was increased from the maximum working capacity of the subject doing pilot study. The duration of the training period was restricted to eight weeks and the number of sessions per week was confined to three. The data obtained from all the groups before and after the experimental period were statistically analyzed by dependent 't' test to find out the significant improvement if any, 0.05 level of confidence was fixed to the level of significance between pre and posttest means of all groups. Pre and post test was conducted on separate days with warm up. The speed measured by 50 meter dash in seconds, flexibility measured by sit and reach test. Further, the findings confirmed the circuit training is suitable protocol to bring out the desirable changes over the speed, flexibility of basketball players.

**Keywords:** Circuit training, basketball players, speed, flexibility

### Introduction

Circuit training is a form of body conditioning or resistance training using high-intensity aerobics. It targets strength building and muscular endurance. An exercise "circuit" is one completion of all prescribed exercises in the program. When one circuit is complete, one begins the first exercise again for the next circuit. Traditionally, the time between exercises in circuit training is short, often with rapid movement to the next exercise. The program was developed by Morgan and Anderson in 1953 at the University of Leeds in England. Circuit training is an efficient and challenging form of conditioning that develops strength, endurance (both aerobic and anaerobic), flexibility and coordination all in one exercise session. It is one of the few forms of fitness training that has been shown to effectively develop both strength and cardiovascular fitness in the same exercise session. The term "circuit training" describes the way a workout is structured rather than the type of exercise performed. It typically consists of a series of exercises or stations completed in succession with minimal rest in between. Circuit routines allow the athlete or coach to create an endless number of workouts and add variety to routine training programs. Circuit training is a type of exercise program where one does a series of timed exercises at a fairly rapid pace, with a brief period of rest in between each exercise. Circuit training workouts may target the entire body or just one specific area, such as the arms, legs, or chest. In addition, circuit training workouts may focus on strength training, aerobics, or a combination of the two; the possibilities are virtually limitless. In general, there are four types of circuit training workouts, and these include a timed circuit, a competition circuit, a repetition circuit, and a sport specific/running circuit. Each of these types of circuit training workouts can be effective and serve a different purpose depending on one's existing level of physical fitness. All of these circuit types can last as long as the exerciser chooses, but it is necessary to determine the full amount of time first. The first type of circuit training workout, a timed circuit, is the most basic. In this type, one simply sets time limits for periods of exercise and rest. For instance, one might exercise for 30 seconds, followed by a 30 second rest period, then switch to a different exercise for 30 seconds, followed by another rest period. (Elizabeth Quinn 2011).

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**Methodology**

The purpose of the study was to find out the effect of circuit training on physical fitness variables of college level men basketball players. To achieve the purpose of the study, thirty men basketball players were randomly selected from Bharathiar University Coimbatore. Their age ranged between 18 and 24 years. They were divided into two equal groups consist of 15 each. The group I (n=15) was considered as control group. The group II (n=15) was considered as experimental group. The investigator did not made any attempt to equate the group. The control group was not given any treatment and the experimental group was given circuit training for three days per week. The experimental group was given training for period of six weeks of circuit training. The test used to assess the performance and physical fitness variables are given in.

S.NO	Variables	Test items	Unit of measures
1	Speed	50m dash	In Seconds
2	Flexibility	Sit and reach	Centimeters

**Training program**

The training program was lasted for 45 minutes per session in a day, 3 days in a week for a period of six weeks duration. These 45 minutes included 5 minutes warm up and 5 minutes warm down remaining 35 minutes allotted for seven station

circuit training programme. Every two weeks of training 5% of intensity was increased from 65% to 75% of work load.

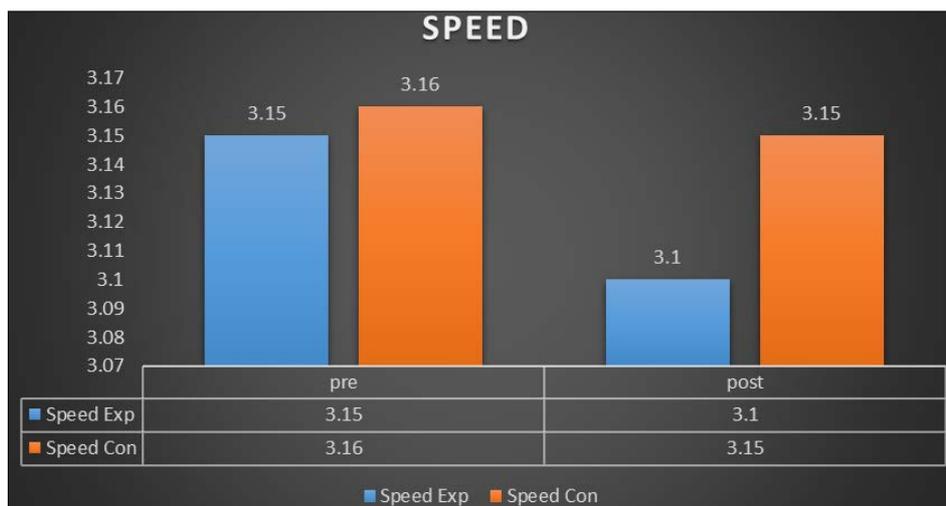
**Table 1:** Computation of 't' ratio on speed on experimental group and control group (Scores in Numbers/seconds)

Groups	Pre-Test	Post-Test	Numbers	SD	"T" Ratio
Experimental Group	3.15	3.10	15	0.04	18.09*
Control group	3.16	3.15	15	0.06	1.14

\*significant level 0.05 level (degree of freedom 2.14, 1 and 14)

Table I reveals the computation of mean, standard deviation and 't' ratio on selected variables namely speed of experimental group. The obtained 't' ratio on speed were 18.09 respectively. The required table value was 2.14 for the degrees of freedom 1 and 14 at the 0.05 level of significance. Since the obtained 't' values were greater than the table value it was found to be statistically significant.

Further the computation of mean, standard deviation and 't' ratio on selected variables parameters namely speed of control group. The obtained 't' ratio on speed were 1.14 respectively. The required table value was 2.14 for the degrees of freedom 1 and 14 at the 0.05 level of significance. Since the obtained 't' values were lesser than the table value it was found to be statistically not significant.



**Fig 1:** Bar diagram showing the mean value on speed of basketball players on experimental and control group

**Table 2:** Computation of 't' ratio on flexibility on experimental group and control group (Scores in Numbers/seconds)

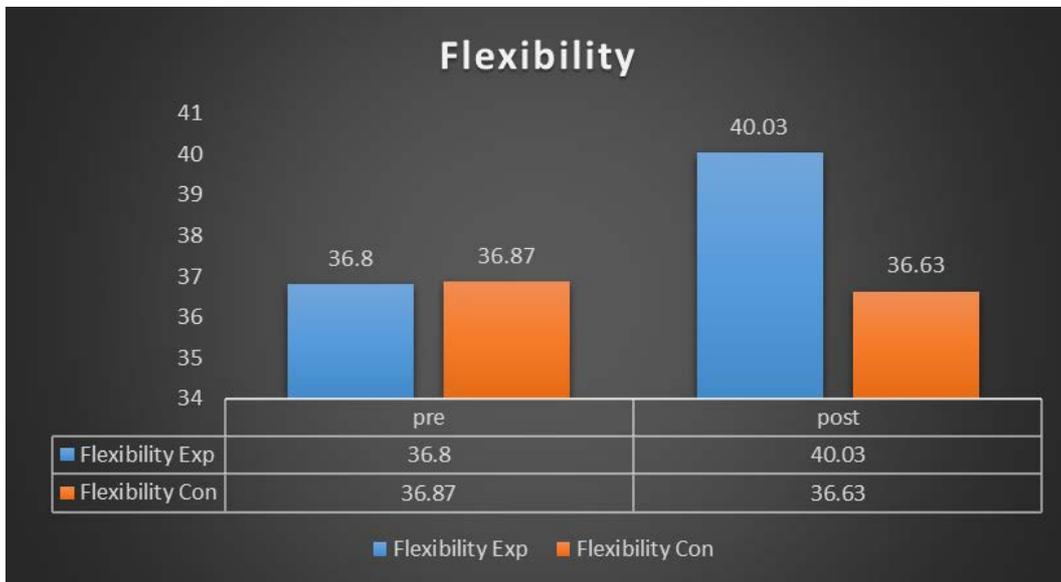
Groups	Pre-test	Post-test	Numbers	Sem	"t" Ratio
Experimental Group	36.80	40.030	15	1.30	20.63*
Control group	36.87	36.63	15	1.47	1.42

\*significant level 0.05 level (degree of freedom 2.14, 1 and 14)

Table I reveals the computation of mean, standard deviation and 't' ratio on selected variables namely flexibility of experimental group. The obtained 't' ratio on resting flexibility were 20.63 respectively. The required table value was 2.14 for

the degrees of freedom 1 and 14 at the 0.05 level of significance. Since the obtained 't' values were greater than the table value it was found to be statistically significant.

Further the computation of mean, standard deviation and 't' ratio on selected variables parameters namely flexibility of control group. The obtained 't' ratio on flexibility were 1.42 respectively. The required table value was 2.14 for the degrees of freedom 1 and 14 at the 0.05 level of significance. Since the obtained 't' values were lesser than the table value it was found to be statistically not significant.



**Fig 2:** Bar diagram showing the mean value on flexibility of football players on experimental and control group

### Discussions on findings

The results of the study indicated that the selected physical fitness variables, speed, flexibility, were improved significantly after undergoing circuit training. The changes in the selected parameters were attributed the proper planning, preparation and execution of the training package given to the players. The findings of the present study had similarity with the findings of the investigations referred in this study. However the subjects participated in the control group did not improve their speed, flexibility. Vega *et al.* (2013) reported that the circuit training program was effective to increase and maintain both muscular and cardiovascular endurance among schoolchildren. Manickam (2013) suggests that there was a significant improvement on selected strength and endurance parameter namely leg strength and strength endurance. Taşkin (2009) <sup>[15]</sup> indicated that the circuit training, which is designed to be performed 3 days a week during 10 weeks of training, improves sprint-agility and anaerobic endurance. Sarachandra (2014) reported that the circuit training was significantly improved the speed and agility among young high school football players. Hofstetter *et al.* (2011) <sup>[6]</sup> indicated that the circuit training session per week led to greater improvements in total physical fitness score, but did not increase injury rates. Sethy *et al.* (2010) suggested that the circuit training is effective in improving muscle strength and endurance, and in decreasing the fatigue of the subject thereby improving the subject's ability to walk.

### Conclusions

Based on the results of the study following conclusion have been arrived.

There was a significant improvement in speed of college level men basketball players due to the influence of circuit training. Six weeks of circuit training improved the flexibility of college level men basketball players.

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