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## Effect of circuit training on physical fitness variables of Kabaddi players

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### Abstract

The purpose of the present investigation was to determine the effects of circuit training on physical fitness variable of Kabaddi players. To achieve this sixty physically active male Kabaddi players ( $N = 60$ ) were selected as subjects and their age group ranged between 18 and 25 years. The researcher gave the 8 weeks circuit training to the experimental group and tests the pre and post results from the same group. Both experimental groups underwent their respective experimental treatment for eight weeks, five days a week and one session on daily. Circuit training was comprised into ten stations. The collected data was analysed using t-test at .05 level of significance. The result of the study revealed that there were significant improvement in physical fitness level of Kabaddi players after eight weeks circuit training.

**Keywords:** physical fitness, strength, endurance, agility, speed

### Introduction

In the case of Kabaddi, the basic skills like holding, riding, blocking, and breath holding are highly needed. It is true that these skills are basic abilities for all Kabaddi players, but the performance potential depends on specific variables. The coaches and trainers may not be able to determine them by their subjective observations of performances alone. A scientific analysis of the player's performance with respect to their skills might help in a much more positive way. This will enable not only the right type of selection based on scientific data but also help in maximizing the player's potentials by regrouping and synchronizing the team talents that are available. Hence, the selection, the training, the performance and monitoring of game strategies can be updated by a study

on scientific training and performance of the players. Though the players of the team are drawn from a particular age group, as in the case of University Teams, and their general skills measure to a standard level which has ensured their selection in their respective University Teams, their performance levels may vary, deciding the success or failure of their teams. In sports, successful performance in competition depends substantially on the physical characteristics, body composition, muscular performance, neuromuscular capability and mental ability of the players. Agility is a common term used in strength and conditioning and is often considered an essential element of many sports and activities. A boxer dodging a punch, a ballet dancer completing a pirouette, or a wrestler finishing a take-down could all be considered examples of agility. However, individuals involved in the development and improvement of sports performance often regard agility as a locomotor skill whereby an athlete changes direction. This type of movement is frequently observed in most field and court sports such as soccer, basketball, football, and lacrosse. In this light agility is commonly defined as an effective and quick coupling of braking, changing directions and accelerating again while maintaining motor control in either a vertical or horizontal direction (Drabik, 1996, Plisk, 2000 and Versteegen & Marcello, 2001) <sup>[4, 11]</sup>. It is the ability to change the position entirely and accurately either in space or in ground (Wynn & Johnson, 1970). An athlete that displays good agility will most likely possess other qualities such as, dynamic balance, spatial awareness, rhythm, as well as visual processing (Ellis *et al.*, 2000) <sup>[5]</sup>. So while agility can be simply defined as an ability to quickly stop and re-start motion, there is a high degree of complexity to this motor skill. Kabaddi is essentially an Indian game, which commands huge popularity in India as well as in its hinterland.

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In India, Kabaddi is popular in different names. In the southern parts of India, the game is referred to as Chedugudu or Hu-Tu-Tu. In eastern India, it is fondly called Hadudu (for men) and Kit-Kit (for women). The game is known as Kabaddi in northern India. Breath control, raid, dodging and movement of hand and feet are the basic skills that one has to acquire, in order to play Kabaddi.

Physical fitness is the basic requirement for most of the tasks to be under taken by an individual in his daily life. Physical fitness is one's richest possession; it cannot be purchased but only obtained through regular routines of physical exercises. A close relationship exists between physical fitness and sports performance. In case the standard of games and sports in the country is to be improved, adequate stress have to be given for enhancing the physical fitness status of sports persons. Regular participation on training schedule improves all the important physical, physiological and psychological fitness components. Circuit training was developed by R. E. Morgan and G. T. Anderson in 1953 at the University of Leeds in England (Sorani, 1966). The term circuit refers to a number of carefully selected exercises arranged consecutively.

In the original format, 9 to 12 stations comprised the circuit. This number may vary according to the design of the program. Each participant moves from one station to the next with little (15 to 30 seconds) or no rest, performing a 15- to 45-second workout of 8 to 20 repetitions at each station (using a resistance of about 40% to 60% of one-repetition maximum). The program may be performed with exercise machines, hand-held weights, elastic resistance, calisthenics or any combination.

Kabaddi is a game of speed, strength, strategy and, most importantly, lungpower. First you'll need twenty-four people split into two teams of twelve.

Only seven players per team are on the playing field at the same time. The remaining teammates are reserves that can "sub in" later. The two teams go to opposite sides of the field, which is divided in two equal sections. Flip to see who goes first. That team starts out on offense and the two teams' alternate offense/defense each turn until the game is over.

Here's where it gets interesting. The offending team sends out their "raider" to the enemy side of the field, where he must try to touch as many opposing teammates as possible before returning safely to his side of the court. The catch must do all of this while telling "Kabaddi, Kabaddi, Kabaddi, Kabaddi..." repeatedly and in one long breath.

**Materials and method**

Sixty Kabaddi players age group of 18 to 25 years studying in different schools with having at least inter-school participation in Kabaddi were selected as subject for this study. The age of the subjects was confirmed through their concerned school records. The students having any injury or disease were not included in the study. It was emphasized that all the students should give their best achievements so that accurate results could be obtained.

Six weeks, three days a week circuit training programme was prepared. Every Saturday was active rest and every Sunday was the rest day. Sixty subjects were taken for the research study.

All of these 60 were in experimental group and given training as per training programme and played as per their routine. The subjects of the study were not fully about understanding the purpose of the study; even then the efforts were made to make them understand the objects of the study and the task to be performed by them. Requesting their physical education

teachers who addressed and advised them to fully cooperate during the research study ensured the motivational technique used for seeking their maximum cooperation.

Circuit training was comprised into ten stations. The collected data was analysed using t-test at .05 level of significance. APHERED physical fitness test were for collection of data and pre and post training test were conducting for analyses of data.

**Data Analysis**

Mean and standard deviation were calculated for physical fitness for each groups i.e. pre circuit training and post circuit training. And the data were analyzed by using t-test to determine the significant difference between the two means. All analysis was carried out using SPSS version (Field, 2000) [6] and statistical significance was set to priority at p<0.05.

**Results**

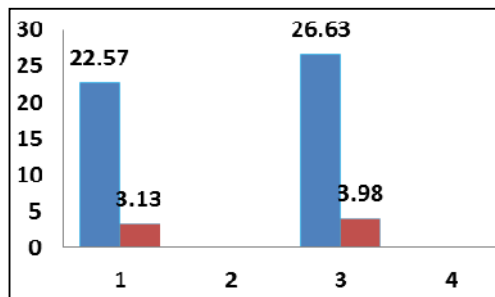
**Table 1:** Analysis of Circuit Training program on Physical Fitness Variables (Sit Ups)

Sit Ups	Mean	S.D.	S.E.D.	t-Value
Pre Circuit Training Test N=60	22.57	3.13	0.654	5.8005*
Post Circuit Training Test N=60	26.63	3.98		

\*Significance at .05 level of significant

The means scores of Pre and post circuit training were 22.57 and 26.63 respectively and SD of Pre and post circuit training were 3.13 and 3.98 respectively and the calculated "t" value of 5.8005 which was more than table value (1.97) at 0.05 level of significance.

Hence we can say that significant difference exists between the Pre and Post Circuit Training programme on Sit up items of physical fitness variables and hypothesis of research was rejected.



**Fig 1:** Means and SD score of Pre and Post Circuit Training of Sit up

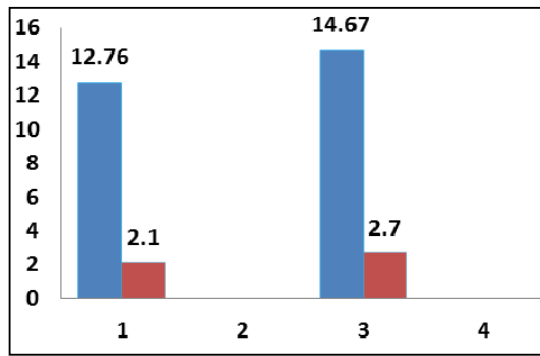
**Table 2:** Analysis of Circuit Training program on Physical Fitness Variables (Pull Ups)

Pull Ups	Mean	S.D.	S.E.D.	t-Value
Pre Circuit Training Test (N=60)	12.76	2.1	.442	4.325*
Post Circuit Training Test (N=60)	14.67	2.7		

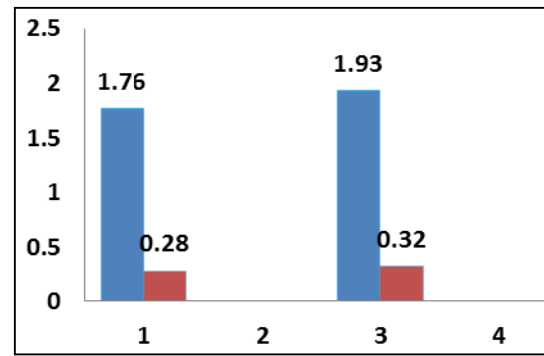
\*Significance at .05 level of significant

The means scores of Pre and post circuit training were 12.76 and 14.67 respectively and SD of Pre and post circuit training were 2.1 and 2.7 respectively and the calculated "t" value of 4.325 which was more than table value (1.97) at 0.05 level of significance.

Hence we can say that significant difference exists between the Pre and Post Circuit Training programme on Pull ups items of physical fitness variables and hypothesis of research was rejected.



**Fig 2:** Means and SD score of Pre and Post Circuit Training of Pull ups.



**Fig 4:** Means and SD score of Pre and Post Circuit Training of Standing Broad Jump.

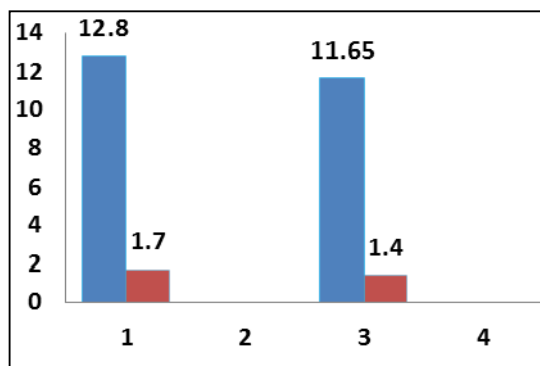
**Table 3:** Analysis of Circuit Training program on Physical Fitness Variables (Shuttle Run)

Shuttle Run	Mean	S.D.	S.E.D.	t-Value
Pre Circuit Training Test N=60	12.80	1.7	.284	4.044*
Post Circuit Training Test N=60	11.65	1.4		

\*Significance at .05 level of significant

The means scores of Pre and post circuit training were 12.80 and 11.65 respectively and SD of Pre and post circuit training were 1.7 and 1.4 respectively and the calculated “t” value of 4.044 which was more than table value (1.97) at 0.05 level of significance.

Hence we can say that significant difference exists between the Pre and Post Circuit Training programme on Shuttle Run items of physical fitness variables and hypothesis of research was rejected.



**Fig 3:** Means and SD score of Pre and Post Circuit Training of Shuttle Run.

**Table 4:** Analysis of Circuit Training program on Physical Fitness Variables (Standing Broad Jump)

Standing Broad Jump	Mean	S.D.	S.E.D.	t-Value
Pre Circuit Training Test N=60	1.76	.28	.055	3.096*
Post Circuit Training Test N=60	1.93	.32		

\*Significance at .05 level of significant

The means scores of Pre and post circuit training were 1.76 and 1.93 respectively and SD of Pre and post circuit training were .28 and .32 respectively and the calculated “t” value of 3.096 which was more than table value (1.97) at 0.05 level of significance.

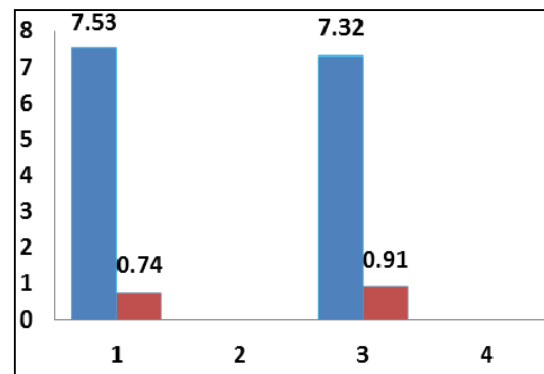
Hence we can say that significant difference exists between the Pre and Post Circuit Training programme on Standing Broad Jump items of physical fitness variables and hypothesis of research was rejected.

**Table 5:** Analysis of Circuit Training program on Physical Fitness Variables (50 Yards Dash)

50 Yards Dash	Mean	S.D.	S.E.D.	t-Value
Pre Circuit Training Test N=60	7.53	.74	.151	1.386**
Post Circuit Training Test N=60	7.32	.91		

\*\*Not significance at .05 level of significant

The means scores of Pre and post circuit training were 7.53 and 7.32 respectively and SD of Pre and post circuit training were .74 and .91 respectively and the calculated “t” value of 1.386 which was more than table value (1.97) at 0.05 level of significance. Hence we can say that significant difference was not found between the Pre and Post Circuit Training programme on 50 Yards Dash items of physical fitness variables and hypothesis of research was accepted.



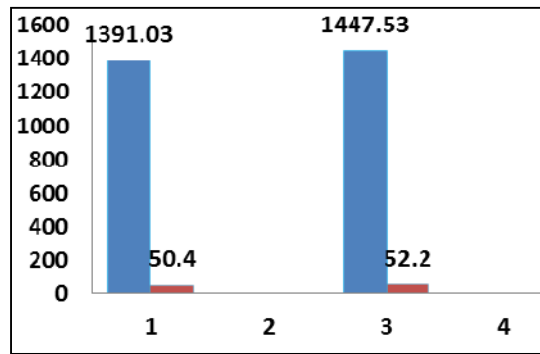
**Fig 5:** Means and SD score of Pre and Post Circuit Training of 50 Yards Dash.

**Table 6:** Analysis of Circuit Training program on Physical Fitness Variables (12 Minutes Run/walk).

12 Minutes Run/walk	Mean	S.D.	S.E.D.	t-Value
Pre Circuit Training Test (N=60)	1391.03	50.4	9.367*	6.03*
Post Circuit Training Test (N=60)	1447.53	52.2		

\*Significance at .05 level of significant

The means scores of Pre and post circuit training were 1391.03 and 1447.53 respectively and SD of Pre and post circuit training were 50.4 and 52.2 respectively and the calculated “t” value of 9.367 which was more than table value (1.97) at 0.05 level of significance. Hence we can say that significant difference exists between the Pre and Post Circuit Training programme on Sit up items of physical fitness variables and hypothesis of research was rejected.



**Fig-6:** Means and SD score of Pre and Post Circuit Training of 12 Minutes Run/walk.

### Discussion

Many studies suggested that Circuit training may be valuable for determining the physical fitness variables such as strength, endurance, agility and speed. Teixeira *et al.*, (2001) <sup>[10]</sup> pointed out that circuit training three times per week is an effective as five times per week. Strength, Endurance, Agility and speed are considered as the main determinants of sports performance. This improvement in physical fitness is beneficial for athletes who require quick movements while performing their sport and support results from other studies. In a study of tennis players, the authors used test to determine speed and agility (Parsons and Jones, 1998) <sup>[9]</sup>. They found that the players became quicker and more agile; enabling them to get to more balls and be more effective tennis players. Neural adaptations usually occur when athletes respond or react as a result of improved coordination between the central nervous system (CNS) signal and proprioceptive feedback (Craig, 2004) <sup>[3]</sup>. Many research studies suggested that circuit training may be valuable for determining the variable such as strength, endurance, agility and speed variables of Kabaddi players. Hence, it is recommended that systematic designed circuit training such as eight to ten stations helps to improve physical fitness; which is absolutely needed for better performance in almost all games.

### Conclusion

Circuit training helps to develop or maintain physical fitness and overall health. It is evident from a number of the adaptations that occur with circuit training that there are several health-related benefits. Circuit training has been shown to increase factors associated with Physical fitness. From the results, the different modes of circuit training can be improved physical fitness during the age between 18 and 25 years of boys. Any practical application requires careful implementation and individual experimentation. The result of the study indicated that there was significant improvement on Physical fitness due to eight weeks of circuit training. From the results, we recommend that circuit training is one of the best methods to improve physical fitness.

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