Research Article

Effect Of Circuit And Interval Trainings On Speed And Agilityamong Male Inter-Collegiate Cricket Players

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Abstract

The purpose of the study was to find the out the effect of circuit and interval trainings on speed and agility among male inter-collegiate cricket players. To achieve the purpose, forty five (45) male cricket players were selected from Govt. degree college kulgam (UT) Jammu and Kashmir. The age of the subjects ranged from 18 to 23 years. The selected subjects were divided into three equal groups namely circuit training group, interval training group and control group of 15 subjects each. Group I underwent the circuit training group (CTG), Group II underwent the interval training group (ITG) and Group III control group (CG) who did not participate any specific training programme apart from their regular routines. Speed and agility were selected as criterion variables and were tested with 50 meters dash and Shuttle run test. The collected data from three groups prior to and post experimentation, paired 't' test was applied to examine the changes within the groups. To find out the significant difference between the groups, Analysis of covariance (ANCOVA) was applied. When the 'F' ratio of adjusted post-test mean was found to be significant, Scheffe's post hoc test was employed to find out the paired mean differences. In all cases, 0.05 level were fixed as level of confidence. The results of the study showed that the two experimental groups namely circuit training group and interval training group achieved significant improvement on speed and agility among male inter-collegiate cricket players.

Keywords: Circuit training, Interval training, Speed and Agility.

Introduction

Cricket, is a game in which fitness is generally considered as a very important. The achievement in 1990s and 2005s of the world beating Australian team has been credited to their demonstrable skill, and to some extend on the way they tended to their fitness. The other test playing countries have legitimately put more stress on fitness as a late and are receiving the rewards with the introduction of one day cricket and all the more as of late twenty 20, the amusement has experienced significant changes and the physical requirements made on a cricketers body have additionally increased drastically **(Jyoti, 2018).**

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Circuit training has become a common mode of exercise, in part because of time efficiency and because lighter loads typically is implemented in such a program **(Baechle, TR 2000).** Interval training can refer to the organization of any cardiovascular work e.g. cycling running, rowing). It prominent in training routines of many sports, but it is particularly employed by runners (**Atkin,William 2015).**

Speed has been expressed as a player's quality of moving at high speed from one place to another, taking as fast as possible, and moving within the shortest period of time **(Gunay, Tamer&Cicioglu, 2010).** Speed of movement both in a straight line and when changing is a clear determinant of performance in many team sports and therefore should be emphasized in the preparation of these athletes. However, speed qualities such as acceleration and acceleration with changes of direction are somewhat distinct from each other and likely require individual attention to maximum performance application to the sports context **(Young et al. 2001).**Agility in team sports does not comprise only the ability of changing the direction of movement, but also the capability to anticipate the movement of the opponent read and react to specific game situations **(Gamble, 2013).** Agility has been defined as "a rapid whole- body movement with change of speed or direction in response to a stimulus" (**Sheppared and young 2006).** Agility expresses the ability to do the most work within a unit of time. The ability to reach the maximum speed of action and reaction and to change the direction or speed of all body movements as a response to a stimulus can be express as agility **(Sonmez, 2014).** Improvement of balance, including speed and explosive power, is considered to be one of the main features of agility improvement. As a result of the agility training, it is aimed to develop power, balance, speed and coordination **(G.Sportts, L.Milanovic et.al 2010).** Agility is not single physical ability, but is composed of components of balance, coordination, speed, reflex, strength, endurance and stamina. These components are each other. Agility can be defined by the ability to explosive begin, reduce speed, change direction and accelerate again quickly while maintaining body control and minimize speed reductions **(Sethu 2014,)** .Agility does not have a global definition, but it is often recognized as the ability to change direction and start and stop quickly **(Gambetta 1996).** To ensure successful performance in sports activities, it is necessary to maintain high level motor performance, and to maintain and sustain static and dynamic balance **(N. Erkmen, et, al 2001).** Agility is closely related to balance because it requires athletes to regulate shifts in the body's centre of gravity while subjecting them to postural deviation. Many athletes and coaches believe that agility is primarily determined by genetic and is therefore difficult to improve to any significant degree **(Mohanasundaram S, Vasanthi G 2013).**

Methodology
Subjects and variables

To achieve the purpose of this study, forty five (45) male cricket players were selected at random as subjects from Govt.degree college kulgam (UT) Jammu and Kashmir and there age ranged between 18 to23 years. The selected subjects were medically examined by a qualified physician and certified that they were medically and physically fit enough to undergo the training programme. The selected subjects were randomly assigned into three equal groups of 15 subjects each. Group I underwent circuit training, group II underwent interval training and group III acted as control. Speed and agility were selected as criterion variables and were tested with 50 meters dash and Shuttle run test.

Table I

Criterion measures

S.no	Variables	Test/ Equipment Used	Measuring Unit
Motor Fitness Variables			
1.	Speed	50 meter dash	In seconds
2.	Agility	Shuttle Run	In seconds

Experimental Design and Statistical technique

The experimental design in this study was random group design involving 45 subjects, who were divided at random into three groups of fifteen each. All the three groups were selected from the same population. No effort was made to equate the groups prior to the commencement of the experimental treatment. In order to nullify the initial differences the data collected from three groups prior to and post experimentation on selected dependent variable were statistically analyzed to find out the significant difference if any, by applying the analysis of covariance (ANCOVA). Since three groups were involved, whenever the obtained 'F' ratio for adjusted post test means was found to be significant, the Scheffe's test was applied as post hoc test to determine the paired mean differences. In all cases level of confidence was fixed at 0.05 for significance.

Analysis of Speed

The descriptive analysis showing mean, percentage of improvement and 't' ratio of the collected data on speedamong experimental and control groups are presented in table I.

Table – I

Descriptive Analysis of the Data on Speed

| Variable	Groups	Pre-TestMean	Post-TestMean	MD	%	't' ratio
Speed	Circuit Training Group	7.50	7.35	0.15	2.00	8.85*
	Interval training Group	7.53	7.41	0.12	1.59	10.28*
	Control Group	7.52	7.51	0.01	0.13	1.62*

*Significant at 0.05 level for the df of 1 and 14 is 2.15

It is clear from the table - I, that there were significant differences between pre-test and post-test data on speed of circuit training group , interval training group and control group because obtained 't' ratio of 8.85 and 10.28 are greater than the required table value of 2.15 at 0.05 level of significance for the df of 1 and 14.However, insignificant difference was found among pre and post test of control group, as obtained 't' ratio of 1.62 is lesser than the required table value of 2.15 at 0.05 level of significance for the df of 1 and 14.

The results of the study also produced 2.00 % of changes in speeddue to circuit training, 1.59% of changes due to interval training and 0.13% of changes in control group.

The percentage of changes on speed of circuit training group, interval training group and control group are given in the figure I.

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Figure - I

Pie Diagram Showing the Percentage of Changes on Speed
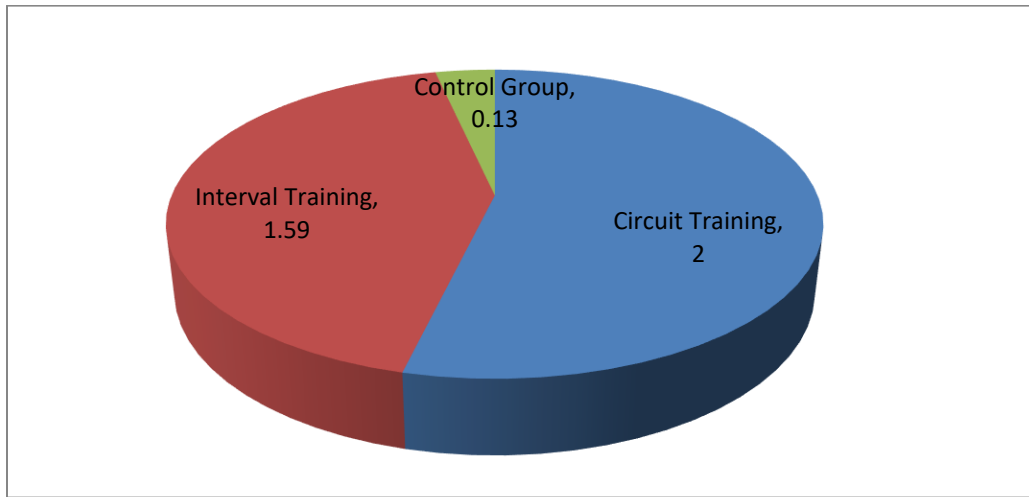
The data collected from the three groups on speed was statistically analyzed by ANCOVA and the results are presented in the table II.

Table - II

Analysis of Covariance on speed of Experimental and Control Groups

Test	CTG	ITG	CG	SoV	SS	DF	MS	F
Pre test				BG	0.007	2	0.003	
Mean	7.50	7.53	7.52	WG	0.175	42	0.004	0.80
SD (±)	0.069	0.052	0.069					
Post-test				BG	0.199	2	0.100	
Mean	7.35	7.41	7.51	WG	0.120	42	0.003	34.84*
SD (±)	0.040	0.037	0.074					
Adjusted Post-test Mean	7.36	7.40	7.51	BG	0.177	2	0.088	
				WG	0.061	41	0.001	59.69*

*Significant, Table value, 2 to 42 & 2 to 41 is 3.22 & 3.23

Table -III shows that pre-test mean values on speed of circuit training group, interval training group and control group are 7.50, 7.53 and 7.52 respectively. The obtained 'F' ratio of 0.80 pre-test score was lesser than the required table value of 3.22 for df 2 and 42 for significance at 0.05 level of confidence on speed. The post-test mean values on speed of circuit training group, interval training group and control group are 7.35, 7.41 and 7.51 respectively. The obtained 'F' ratio value of 34.84 for post-test score was greater than the required table value of 3.22 for the df of 2 and 42 for significance at 0.05 level of confidence on speed.

The adjusted post-test means of circuit training group, interval training group and control group are 7.36, 7.40 and 7.51 respectively. The obtained 'F' ratio value of 59.69 for adjusted post-test score was greater than the required table value of 3.23 for df 2 and 41 for the significance at 0.05 level of confidence on speed. It was concluded that differences subsist among the adjusted post-test means of circuit training group, interval training group and control group on speed. The 'F' value in the adjusted post-test means was found significant, hence the Scheffe's test was applied to assess the paired mean difference and the results are presented in table - III.

Table - III
**Scheffe's Test for the Differences between Paired Means on Speed**

Circuit Training Group	Interval Training Group	Control Group	MD	C I
7.36	7.40		0.04*	
7.36		7.51	0.15*	0.02
	7.40	7.51	0.11*	

From table - III shows that the adjusted post test mean differences on speed between circuit and interval training groups; circuit training and control groups; and interval training and control groups are 0.04, 0.15 and 0.11 for speedrespectively, which is greater than the confidence interval value 0.02, was significant at 0.5 level of confidence.

From the above table, it was imperative that both the experimental groups differed significantly from control group on speed. Significant differences were found between circuit training group and interval training group in improving speed of inter-collegiate male cricket players. Therefore, twelve weeks of interval training showed greater improvement than circuit training on inter-collegiate male cricket players. The findings of the study implies that both the groups improved but interval training were significantly better in improving inter-collegiate male cricket players than other groups confined to this study. The changes in inter-collegiate male cricket players are presented in figure II.

Figure -II

The Pre, Post and Adjusted Post Test Means of Experimental and Control Groups on Speed

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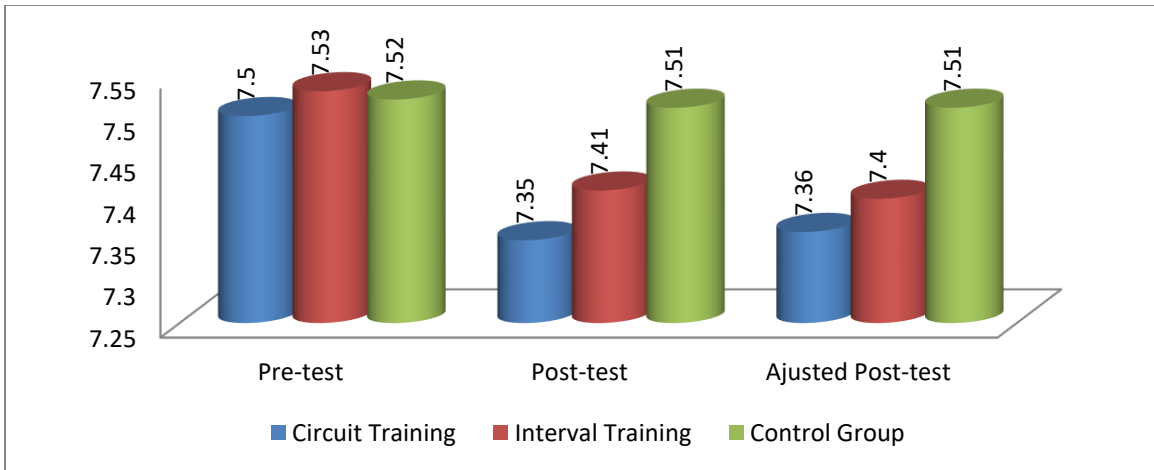
Analysis of Agility

The descriptive analysis showing mean, percentage of improvement and 't' ratio of the collected data on agility among experimental and control groups are presented in table IV.

Table – IV

Descriptive Analysis of the Data on Agility

Variable	Groups	Pre-Test Mean	Post-Test Mean	MD	%	't' ratio
Agility	Circuit Training Group	10.79	10.45	0.34	3.15	9.79*
	Interval training Group	10.78	10.51	0.27	2.50	8.37*
	Control Group	10.75	10.74	0.01	0.09	1.49*

*Significant at 0.05 level for the df of 1 and 14 is 2.15

It is clear from the table - I, that there were significant differences between pre-test and post-test data on agility of circuit training group , interval training group and control group because obtained 't' ratio of 9.79 and 8.37 are greater than the required table value of 2.15 at 0.05 level of significance for the df of 1 and 14. However, insignificant difference was found among pre and post test of control group, as obtained 't' ratio of 1.49 is lesser than the required table value of 2.15 at 0.05 level of significance for the df of 1 and 14.

The results of the study also produced 3.15 % of changes in agility due to circuit training, 2.50 % of changes due to interval training and 0.09 % of changes in control group.

The percentage of changes on agility of circuit training group, interval training group and control group are given in the figure III.

Figure - III

Effect Of Circuit And Interval Trainings On Speed And Agilityamong Male Inter-Collegiate Cricket Players

Pie Diagram Showing the Percentage of Changes on Agility
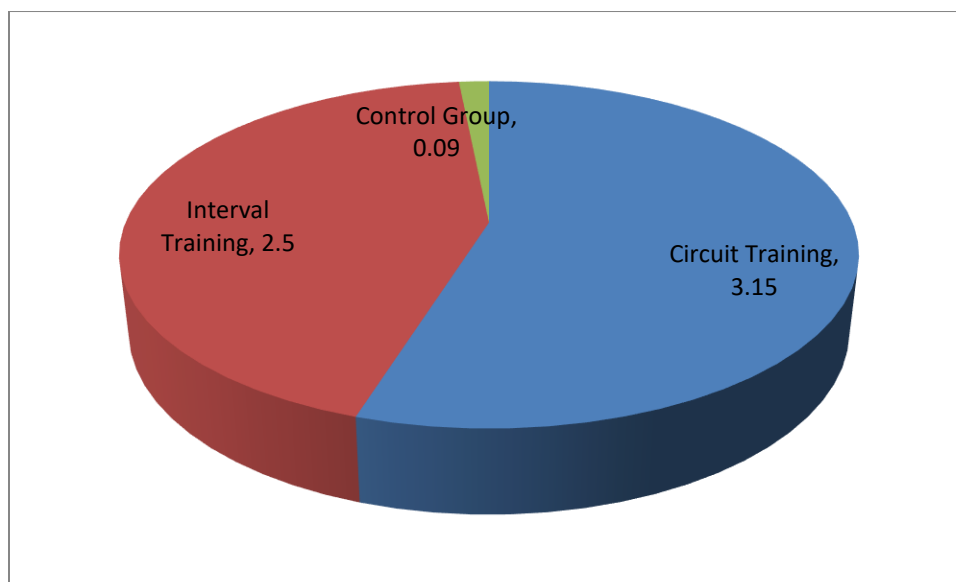
The data collected from the three groups on agility was statistically analyzed by ANCOVA and the results are presented in the table V.

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Table - V

Analysis of Covariance on Agility of Experimental and Control Groups

Test	CTG	ITG	CG	SoV	SS	DF	MS	F
Pre test				BG	0.011	2	0.006	
Mean	10.79	10.78	10.75	WG	0.257	42	0.004	0.91
SD (±)	0.090	0.069	0.073					
Post-test				BG	0.705	2	0.353	
Mean	10.45	10.51	10.74	WG	0.387	42	0.009	38.28*
SD (±)	0.113	0.082	0.089					
Adjusted Post-test Mean	10.44	10.51	10.74	BG	0.726	2	0.363	
				WG	0.366	41	0.009	40.70*

*Significant, Table value, 2 to 42 & 2 to 41 is 3.22 & 3.23

Table - V shows that pre-test mean values on agility of circuit training group, interval training group and control group are 10.79, 10.78 and 10.75 respectively. The obtained 'F' ratio of 0.91 pre-test score was lesser than the required table value of 3.22 for df 2 and 42 for significance at 0.05 level of confidence on agility. The post-test mean values on agility of circuit training group, interval training group and control group are 10.45, 10.51 and 10.74 respectively. The obtained 'F' ratio value of 38.28 for post-test score was greater than the required table value of 3.22 for the df of 2 and 42 for significance at 0.05 level of confidence on agility.

The adjusted post-test means of circuit training group, interval training group and control group are 10.44, 10.51 and 10.74 respectively. The obtained 'F' ratio value of 40.70 for adjusted post-test score was greater than the required table value of 3.23 for df 2 and 41 for the significance at 0.05 level of confidence on agility. It was concluded that differences subsist among the adjusted post-test means of circuit training group, interval training group and control group on agility. The 'F' value in the adjusted post-test means was found significant, hence the Scheffe's test was applied to assess the paired mean difference and the results are presented in table - VI.

Table - VI

Scheffe's Test for the Differences between Paired Means on Agility

Circuit Training Group	Interval Training Group	Control Group	MD	C I
10.44	10.51		0.07*	
10.44		10.74	0.30*	0.007
	10.51	10.74	0.23*	

From table - VI shows that the adjusted post test mean differences on agility between circuit and interval training groups; circuit training and control groups; and interval training and control groups are 0.07, 0.30and 0.23 for agility respectively, which is greater than the confidence interval value 0.007, was significant at 0.5 level of confidence.

From the above table, it was imperative that both the experimental groups differed significantly from control group on agility. Significant differences were found between circuit training group and interval training group in improving agility of inter-collegiate male cricket players. Therefore, twelve weeks of interval training showed greater improvement than circuit training on inter-collegiate male cricket players. The findings of the study implies that both the groups improved but interval training were significantly better in improving inter-collegiate male cricket players than other groups confined to this study. The changes in inter-collegiate male cricket players are presented in figure IV.

Figure -IV

The Pre, Post and Adjusted Post Test Means of Experimental and Control Groups on Agility
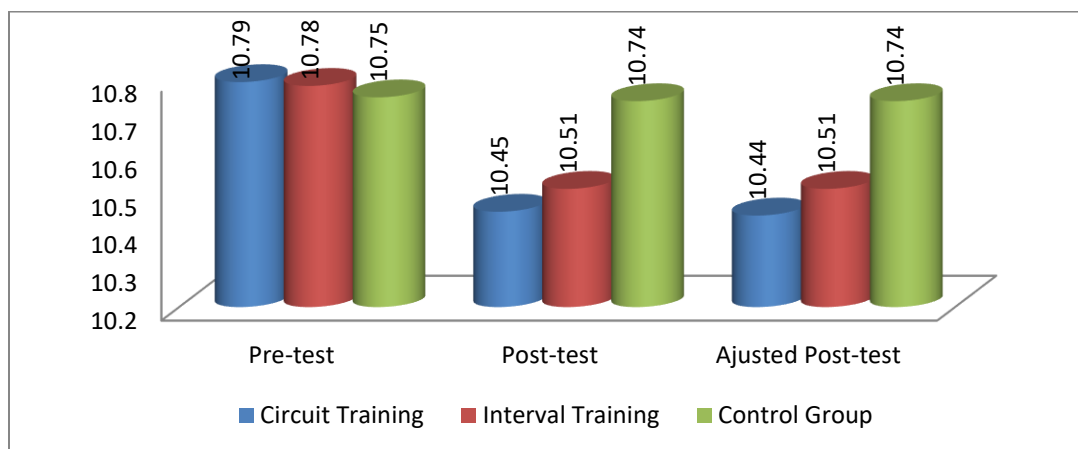
Discussion on Findings

The analysis of covariance indicated that the experimental group – 1 (circuit training) and experimental group - 2 (Interval training) significantly improved the speed and agility. It may be due to the nature of varied regimens of circuit and interval training which have influenced to increase the physiological level and function of various organs and systems. Further, findings of the study showed that control group did not improve the speed and agility. However, the experimental group – 1 had more effect

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on the improvement of greater than experimental -2. The findings of the study are in conformity with the findings of the earlier studies; **Hardiansyah, (2017)** examined the effect of circuit training method to increase physical fitness of FIK UNP students. It can be concluded that the method of training circuits has a significant influence on the enhancement of physical fitness of FIK UNP students. **Sangari& Annadurai (2017)** conducted a study oneffect of polymeric circuit training on development of speed and agility on Basketball players.It was concluded that there is a significant improvement in speed and agility. **Tandel Jignesh, (2017)** assessed the effect of circuit training on speed, agility, and cardio respiratory endurance of handball players. The tiring resulted in signification improvement in speed, Agility, and Cardio Respiratory Endurance. **Kumar, (2016)** conducted a study to find out the effect of circuit training on selected motor abilities among university male students. The results of the study stated that the Circuit Training had significantly improved the speed, leg power, arm power and agility of the subjects. **Velmurugan &Kulothungan (2000)** investigated the effect of circuit training and speed agility quickness training on selected motor fitness among junior football players. The study revealed that the selected motor fitness variables were significantly improved due to the influence of circuit training and SAQ training among junior football players. **Naidu (2016)** investigated the Impact of Speed training combined with Polymeric training and Intensive interval training on Speed endurance the result of the study showed that due to the effect of combined Speed and Polymeric training and combined Speed and Intensive interval training the Speed endurance of subjects is significantly improved. **Palanisamy, Rajashekaran and Kulothungan (2010)** conducted a study to find out the effect of interval training on speed and speed endurance of university women players. The result reveals that there was significant difference between interval training group and control group on speed and speed endurance.

Conclusion

The two experimental groups namely circuit training group and interval training group achieved significant improvement on speed and agility among male inter-collegiate cricket players. The speed performances of the subjects were significantly improved due to the effect of circuit training and interval training. The results of the study produced 2 % of changes on speed due to circuit training, 1.59 % of changes due to interval training

The agility performances of the subjects were significantly improved due to the effect of circuit training and interval training. The results of the study produced 3. 15 % of changes on agility due to circuit training, 2.50 % of changes due to interval training while as control group didn't showed any significant changes.

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