

Effect of 8 Week Circuit Training on Selected Physical Variables in Football Players

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Abstract

The aim of the study was to examine the effects of circuit training on selected physical variables (speed and Explosive strength) in inter-collegiate level football players. Forty male football players participated in this study. The subjects were randomly assigned into two groups, i.e., (i) Circuit Training Group (N=20) and (ii) Control Group (N=20). While Circuit Training Group had undergone selected circuit training exercises the Control Group did not participate in any circuit training exercises. All subjects participated in both pre-test and post-test. The data were collected before and after the 8 weeks Circuit Training Programme. To find out the significant difference 't' test was used. The result of the study shows that there is significant improvement on both the selected Physical variables (Speed and Explosive strength) due to the 8 Weeks Circuit Training Program.

Introduction

Circuit training was developed by R. E. Morgan and G. T. Anderson in 1953 at the University of Leeds in England (Sorani, 1966). Keinth Nicholis defined circuit training as training that "simply involves a series of exercises which must be performed in a specific order until a specified number of circuits have been completed. Each exercise must be done a particular number of times depending on the maximum number of the individual". Several previous studies have confirmed the various effects of resistance training. 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, fifteen to forty five seconds, often with rapid movement to the next exercise. In the original format, 9 to 12 stations comprised the circuit. This number may differ 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 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.

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 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.

Resistance training has also become an essential method to improve athletes' speed and explosive power. Research results show that resistance training improves explosive power, vertical jump, and speed in professional soccer players. (Haghighi,et.al, 2012, Chelly S.M,et.al, 2010). A football player has to perform a large number of explosive movements such as shooting, jumping, tackling, sprinting and pace changing during a match (Haghighi,et.al, 2012, Kumar R,2013). It is very important to attain an optimum level of speed and explosive power in football. Speed and vertical jumping ability are two essential factors that help skilled football players achieve desirable results. Circuit Training exercises are approved resistance training methods for attaining desirable physical variables like speed, explosive strength, agility, and endurance. This study investigated the effect of Circuit Training on speed and explosive power of football players to examine the efficacy of the training method.

Methodology

Subjects & Variables

Forty subjects volunteered to participate. The subjects in this study were forty male football players aged between 18-22 years. The subjects were randomly assigned into two groups- a Circuit Training Group (N=20) and a Control Group (N=20). Subjects were at least eighteen years of age and have represented their college in the inter-collegiate tournament(s).

Table I
Criterion Variables and Test

SI No	Variables	Tests/Instruments	Unit of Measurement
1.	Speed	50 Meters Run	Seconds
2.	Explosive Power	Vertical Jump	Centimeters

Procedure

To perform the study an orientation regarding the topic, purpose and procedure of the study were given to all subjects and they all agreed not to change their exercise habits during the course of the study. The Circuit Training Group participated in a eight week pre-designed nine station circuit training program , using two circuit training sessions per week, while the Control Group were not allowed to participate in any type of resistance training exercises, except in their regular football training program.

Testing Procedures

A Pre test and a Post test were conducted to measure the selected physical variables. To determine the speed of the subjects' 50 meter sprint timing was recorded and to determine the explosive strength, vertical jump test was conducted and the performance was measured in centimetres.

Statistical Analysis

T- test was applied to find out the significance difference between the pre and post-test means of selected Physical variables.

Results and Discussions

The analysis of dependent 't' test of data obtained for the selected physical variables of pre test and post test of experimental group and control group were analyzed and presented in table II.

Table II

Mean and Dependent 't' test of Circuit Training group and Control group on Selected Physical variables.

Speed (50M)	Experiment group		Control group	
	Pre test	Post test	Pre test	Post test
Mean	7.38	7.13	7.55	7.55
S.D	0.2	0.1	0.2	0.2
C.V.	2.9	2.0	3.0	3.0
t-test results	p- value =0.0000005 The mean values of pre test and post test of the experimental group differ significantly at 1% and 5% level of significance		p- value= 0.7778 The mean values of pre test and post test of the control group do not differ significantly at 1% and 5% level of significance	

Speed (50 m)	Pre test		Post test	
	Experimental group	Control group	Experimental group	Control group
Mean	7.38	7.55	7.13	7.55
S.D	0.2	0.2	0.1	0.2
C.V.	2.9	3.0	2.0	3.0
t-test results	p- value =0.067 The mean values of control group and experimental group in pre-test do not differ significantly at 1% and 5% level of significance		p- value= 0.0000243 The mean values of control group and experimental group in post-test differ significantly at 1% and 5% level of significance	

Vertical jump	Experiment group		Control group	
	Pre test	Post test	Pre test	Post test
Mean	49.9	52.5	46.9	47.0
S.D	6.2	6.2	6.1	6.1
C.V.	12.5	11.7	13.0	13.0
t-test results	p- value =0.00000001 The mean values of pre test and post test of the experimental group differ significantly at 1% and 5% level of significance		p- value= 0.651 The mean values of pre test and post test of the control group do not differ significantly at 1% and 5% level of significance	

Vertical jump	Pre test		Post test	
	Experimental group	Control group	Experimental group	Control group
Mean	7.38	46.9	52.5	7.55
S.D	0.2	6.1	6.2	0.2
C.V.	2.9	13.0	11.7	3.0
t-test results	p- value =0.128 The mean values of control group and experimental group in pre-test do not differ significantly at 1% and 5% level of significance		p- value= 0.008 The mean values of control group and experimental group in post-test differ significantly at 1% and 5% level of significance	

Conclusions

From the analysis of the data, the following conclusions are drawn.

1. There is significant improvement on Speed due to Eight week Circuit training programme.
2. There is significant improvement on Vertical Jump due to Eight week Circuit training programme.
3. There is significant difference between Circuit Training group and Control group on the selected Physical variables (Speed and Vertical Jump).
4. There is no significant difference on selected Physical variables among Control group as they didn't undergo any Circuit Training Programme.

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