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EFFECT OF CIRCUIT TRAINING ON SPEED, POWER AND CARDIOVASCULAR ENDURANCE AMONG SECONDARY SCHOOL HOCKEY PLAYERS

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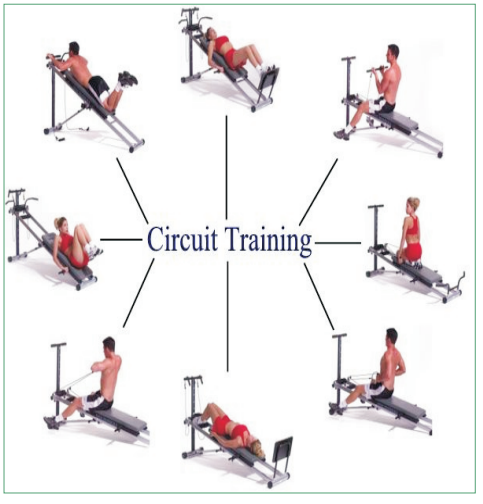
ABSTRACT

Circuit training is a form of body conditioning or resistance training using high-intensity aerobics. It targets strength building and muscular endurance. Circuit training is most popular form of fitness sessions used by various sports teams like Volleyball, Football and Hockey. Hockey is the national game of India and



Hockey player requires high level of motor fitness to excel at different levels of competitions. Motor fitness components like speed, power and endurance plays an important role in improving the fitness level of players. The purpose of the study was to evaluate the effectiveness of circuit training on speed, power and endurance of secondary school hockey players. For this purpose, thirty secondary school Hockey players in the age group of 14 to 16 years were selected as subjects. The selected subjects were divided into two equal groups, in which, Group-I: Circuit Training Group (CTG) (n=15) underwent circuit training and Group–II: Control Group (CG) (n=15) acted as control which did not participate any training but allowed to take part in their regular Hockey training and playing game. The training programme was carried out for this study was five days per week for twelve weeks. Prior to and after the training period the subjects were tested for speed, power and cardiovascular endurance. These were assessed by administering 50 Meters Run, Standing Broad Jump and Cooper's 9 minutes Run/Walk respectively. The statistical tool used for the present study was 't' test. After applying the 't' test, it was found that there was significant improvement in the selected motor fitness variables such as speed, explosive power and cardio respiratory endurance in Circuit Training Group (CTG) when compared with control group.

KEYWORDS :*Circuit Training, speed, explosive power and cardio respiratory endurance.*

INTRODUCTION :

Hockey is one of the world greatest and favourite ball game. Present days the game hockey is being played by adopting new techniques, strategies, methods and skills during training schedules. The motor abilities are considered as one of the important factors affecting on every game and events, and the availability of motor abilities for the Hockey players sufficiently enable them to achieve better performance and high achievement, the importance of motor abilities are not confined only within the field of sports, but it also is important for everyone in the community in general.

In the game of hockey, a player must play vigorously to hit the ball, dribble the ball fast and frequently and change direction abruptly during the play. Strength and Speed are necessary motor components for good hockey performance. The quality of muscular endurance and cardio respiratory endurance is highly required for a Hockey player to improve his performance. Higher level of performance of a hockey player may be dependent upon the motor abilities

According to Cratty and Hution (1969) "speed is designed as capacity of an individual to perform successive movement of the same pattern at a faster rate". Mathew (1970) defined "power is the individual capacity to exert maximal muscular force to perform a specific job. The ability is to activate maximal muscle fibers for forceful contraction." There are trainings like circuit training and weight training to develop and improve strength and interval and resistance training to improve the speed. Circuit training has been proved to be a very effective method for improving strength endurance (Seaton, 1983).

An exercise 'circuit' is one completion of all prescribed exercises in the program. Circuit training is the programme in which an athlete moves from one exercise station to another in a planned sequence and in the shortest possible time (Neal, 1969). Circuit training is an excellent way to improve mobility, strength and stamina. Circuit training comprises of 6 to 10 strength exercises that are completed one exercise after another. Each exercise is performed for a specified number of repetitions or for a set time before moving on to the next exercise. Circuit training is one such training method used in a strength and conditioning programme. Effective programme design and implementation can result in improved performance of any event.

OBJECTIVE OF THE STUDY

The objective of the study was to determine the effect of circuit training on selected motor fitness variables of secondary school Hockey players.

HYPOTHESIS OF THE STUDY

It is hypothesized that there would be a significant difference in the selected Motor Fitness variables of experimental group by practicing circuit training.

2.METHODOLOGY

For this purpose, thirty secondary school Hockey players in the age group of 14 to 16 years were selected as subjects. The selected subjects were divided into two equal groups, in which, Group-I: Circuit Training Group (CTG) (n=15) underwent circuit training and Group–II: Control Group (CG) (n=15) acted as control which did not participate any training but allowed to take part in their regular Hockey training and playing game. The training programme was carried out for this study was five days per week for twelve weeks. Prior to and after the training period the subjects were tested for speed, power and endurance. These were assessed by administering 50 Meters Run, Standing Broad Jump and Cooper's 9 minutes Run/Walk respectively. The collected data was evaluated using 't' test analysis. The

proposed hypothesis was tested at 0.05 and 0.01 levels of confidence. The Statistical Package for Social Science (SPSS) and MS Office Excel 2007 was used.

3.ANAYSIS OF DATA

The data collected prior to and after the experimental period on selected Motor Fitness variables such as speed, explosive power and cardio respiratory endurance of Circuit Training Group (CTG) and Control Group (CG) were analyzed and presented in the following table-1.

Table-1

Table showing 't' test analysis between pre test and post test scores for selected Motor Fitness variables such as Speed, Explosive Power and Cardio Respiratory Endurance for Circuit Training (CTG) and Control Group (CG) (N=15 Each group).

Motor Fitness Variables	Tests	Control Group			Experimental Group		
		Mean	SD	't' Value	Mean	SD	't' Value
Speed (In Secs.)	Pre Test	7.990	0.250	0.17^{NS}	7.993	0.313	2.41*
	Post Test	7.974	0.257		7.680	0.259	
Leg Explosive Strength (In Meters)	Pre Test	1.886	0.069	0.28^{NS}	1.906	0.013	4.05**
	Post Test	1.893	0.056		1.986	0.014	
Cardio Respiratory Endurance (In Meters)	Pre Test	2443.666	230.948	0.10^{NS}	2499.666	92.049	2.78**
	Post Test	2452.000	222.957		2587.333	79.706	

^{NS}Not Significant: * Significant at 0.05 level [Table Value=2.02]; ** Significant at 0.01 level [Table Value=2.71]

The above table-1 shows that the obtained 't' values 0.17 (Speed); 0.28 (Explosive Power); and 0.10 (Cardio Respiratory Endurance) for control group which are less than the table value 2.02, hence, it was not significant even at 0.05 level of confidence. It is concluded that the changes made from pre-test to post test was statistically not significant among control group.

The table further shows that that the obtained 't' values 2.41 (Speed); 4.05 (Explosive Power) 2.78 (Cardio Respiratory Endurance) for Circuit Training Group (CTG) which are greater than the table value 2.02, hence, it is significant. It is concluded that the Circuit Training Group (CTG) was significantly improved the selected motor fitness variables of secondary school Hockey players. This may be due to circuit training group subjects participated in circuit training programme.

4. DISCUSSION ON FINDINGS

The present study find out the effect of Circuit Training Group (CTG) programme on selected motor fitness variables of secondary school Hockey players. After administration of tests for collection of data with appropriate statistical analysis, the researcher has made an attempt to discuss the findings based on the obtained results. The researcher examined the effect of circuit training on selected motor fitness variables such as speed, leg explosive power and cardio respiratory endurance of secondary school Hockey players. The result shows that the 12 weeks specific exercises of circuit training improved speed, leg explosive power and cardio respiratory endurance of secondary school Hockey players. This may be due to subjects participated in circuit training was to specifically target the requirements of

competitive Hockey players. Previous studies in which children performed an extra curricular circuit training programme shows a significant improvement on both muscular and cardio-respiratory endurance (Daniel Mayorga Vega (2013), Chavan (2013) and Shelvam (2014). found that specific exercise programme was improved the physical fitness variables of Basketball Players. Circuit Resistance Training is effective in improving speed, power and endurance in secondary school hockey players during competitive phase.

5.CONCLUSION

This study confirmed that the circuit training group was significantly improved the speed, leg explosive power and cardio respiratory endurance of secondary school Hockey players when compared to control group.

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