



Academic Sports Scholars

EFFECT OF CIRCUIT TRAINING ON SELECTED PHYSICAL FITNESS COMPONENTS OF COLLEGE LEVEL MEN HOCKEY PLAYERS

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ABSTRACT

This study was designed to investigate the effect of circuit training on selected physical fitness components of college level men hockey players. To achieve the purpose of the study thirty male hockey players were selected from Dr. NGP College of arts and science, Coimbatore. Their age ranged

between 18 and 25 years. The subjects were randomly assigned into two equal groups (n=15). Group- I underwent circuit training (Experimental group) and Group- II was acted as control group (N=15). The circuit training was given to the experimental group for 3 days per week (Monday, Wednesday and Friday) for the period of eight weeks. The control group was not given any sort of training except their routine work. The speed (50meters dash), agility (shuttle run) and cardio respiratory endurance (12 minutes run and walk test) was measured by standardised tests. The data collected from the subjects were statistically analyzed with 't' ratio, to find out significant improvement if any at 0.05 level of confidence. The result of the speed, agility and cardio respiratory endurance improved significantly due to circuit training



with the limitations of diet, climate, life style status and previous training. The results of the present study coincide with the findings of the investigation done by different experts in the field of sports sciences.

KEYWORDS: Circuit training, Speed, Agility, Cardio respiratory endurance.

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. Morgan and Anderson (1953). 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.

The second type of circuit training workout is a competition circuit. In this type of workout, the circuits are timed, but the exerciser pushes him-self or her-self to achieve as many repetitions as possible. For instance, if one chooses to do push-ups for 30 seconds, followed by 30 seconds of rest, as in the timed circuit, he might first see how many push-ups he can do in 30 seconds. He will then try to improve that number every time he does circuit training. The first day he might do ten push-ups; the second day, 11 or 12, and so on. In a repetition circuit, which is a less common type of circuit training method, the periods of exercise are not timed, but are instead counted by repetitions. Once again, using the push-up example, one might decide to do 20 push-ups, followed by 30 seconds of rest. This is somewhat less common because speed is often one of the main goals of circuit training, and a repetition circuit can be fairly slow. Scholich (1989).

Circuit training involves moving from one exercise to another in quick succession. A circuit typically consists of five to 10 exercises performed for 30 to 90 seconds each. You can create a circuit to meet almost any exercise goal. A circuit training workout helps you expedite your workout and builds endurance because it leaves no time for rest between exercises. While a circuit might include any one of hundreds of exercises, the workouts fall into several specific categories. Cespedes (2013).

The hypothesis argued in this paper is that college level men hockey players can significantly improve the parameters of speed (50 mts dash), agility (shuttle run) and cardio respiratory endurance (12 min run and walk test) by combining normal technical and tactical sessions with a circuit training program over a consecutive 8 weeks period. Till date no study has been Therefore, the object of this study was to investigate the changes in the parameters produced during 8 weeks of circuit training in 30 college level men hockey players.

METHODS

Experimental approach to the problem

We selected 30 college level men hockey players from Dr. NGP College of arts and science, Coimbatore. The subjects were randomly assigned into two equal groups namely, circuit training (experimental group) (N=15) and control group (N=15). The circuit training was given to the Experimental group for 3 days per week (alternate days) for the training period of eight weeks. The Control group was not given any sort training except their routine.

DESIGN

The evaluated parameters were speed (50 mts dash), agility (shuttle run) and cardio respiratory endurance (12 min run walk). The selected parameters were measured before and after the circuit training programme and the effects of the training programme were examined.

STATISTICAL ANALYSIS

The collected data on above said variables due to the effect of circuit training after regular physical exercise was statistically analyzed with 't' test to find out the significant improvement between pre and post test. In all cases the criterion for statistical significance was set at 0.05 level of confidence. ($P < 0.05$).

TRAINING PROGRAMME:

The training programme was lasted for 45 minutes for session in a day, 3 days, in a week for a period of 8 weeks duration. These 45 minutes included 5 minutes warm up, 15 minutes regular physical exercises, circuit training for 20 minutes and 5 minutes warm down. Every two weeks of training 5% of intensity of load was increased from 65% to 80% of work load. The volume of circuit training is prescribed based on the number of sets and repetitions. The circuit training exercises are Squat jump to catch, Press-up, Zig-zag running, Sit-ups, Bench-run, Split-jump, Pushups, Shuttle run.

TABLE - I
COMPUTATION OF 't'-RATIO BETWEEN PRE AND POST TEST MEANS OF
EXPERIMENTAL GROUP AND CONTROL GROUP ON SPEED

Group		Mean	Standard deviation	Mean Difference	Standard error mean	t-ratio
Experimental Group	Pre test	7.05	0.50	0.04	0.003	12.38*
	Post test	7.01	0.50			
Control Group	Pre test	7.16	0.43	0.01	0.0017	1.14
	Post test	7.15	0.43			

*significant of 0.05 level (2.14) 1 and 14

Table I reveals that the computation of 't' ratio between mean of pre and post test on speed of college level men hockey players. The mean values of pre and post test of experimental group were 7.05 and 7.01 respectively. Since, the obtained 't' ratio 12.38 was higher than the required table value 2.145, it was found to be statistically significant for the degree of freedom 1 and 14 at 0.05 level of confidence. The results clearly indicated that the speed of the experimental group improved due to the influence of circuit training.

Table I reveals that the computation of 't' ratio between mean of pre and post test on speed of college men hockey players. The mean values of pre and post test of control group were 7.16 and 7.15 respectively. Since, the obtained 't' ratio 1.14 was lesser than the required table value 2.145, it was found to be statistically not significant for the degree of freedom 1 and 14 at 0.05 level of confidence. The results clearly indicated that the speed of the control group had not been improved.

TABLE -II
COMPUTATION OF 't'-RATIO BETWEEN PRE AND POST TEST MEANS OF EXPERIMENTAL GROUP AND CONTROL GROUP ON AGILITY

Group		Mean	Standard deviation	Mean Difference	Standard error mean	t-ratio
Experimental Group	Pre test	9.87	0.24	0.27	.06345	4.302*
	Post test	9.60	0.20			
Control Group	Pre test	9.81	0.34	0.02	0.009	1.62
	Post test	9.83	0.33			

*significant of 0.05 level (2.14) 1 and 14

Table II reveals that the computation of 't' ratio between mean of pre and post test on of agility college level men hockey players .The mean values of pre and post test of experimental group were 9.87 and 9.60 respectively. Since, the obtained 't' ratio 4.302 was higher than the required table value 2.145, it was found to be statistically significant for the degree of freedom 1 and 14 at 0.05 level of confidence. The results clearly indicated that the agility of the experimental group improved due to the influence of circuit training.

Table II reveals that the computation of 't' ratio between mean of pre and post test on agility of college level men hockey players .The mean values of pre and post test of control group were 9.81 and 9.83 respectively. Since, the obtained 't' ratio 1.62 was lesser than the required table value 2.145, it was found to be statistically not significant for the degree of freedom 1 and 14 at 0.05 level of confidence. The results clearly indicated that the agility of the control group had not been improved.

TABLE -III
COMPUTATION OF 't'-RATIO BETWEEN PRE AND POST TEST MEANS OF EXPERIMENTAL GROUP AND CONTROL GROUP ON CARDIO RESPIRATORY ENDURANCE

Group	Group	Mean	Standard deviation	Mean Difference	Standard error mean	t-ratio
Experimental Group	Pre test	2185.33	275.83	239.33	61.45	3.89*
	Post test	2424.66	278.85			
Control Group	Pre test	2044.66	354.51	24	18.12	1.32
	Post test	2068.66	368.31			

*significant of 0.05 level (2.14) 1 and 14

Table III reveals that the computation of 't' ratio between mean of pre and post test on cardio respiratory endurance of college level men hockey players .The mean values of pre and post test of experimental group were 2185.33 and 2424.66 respectively. Since, the obtained 't' ratio 3.89 was higher than the required table value 2.145, it was found to be statistically significant for the degree of freedom 1 and 14 at 0.05 level of confidence. The results clearly indicated that the cardio respiratory endurance of the experimental group improved due to the influence of circuit training.

Table III reveals that the computation of 't' ratio between mean of pre and post test on cardio respiratory endurance of college level men hockey players .The mean values of pre and post test of control group were 2044.66 and 2068.66 respectively. Since, the obtained 't' ratio 1.32 was lesser than the required table value 2.145, it was found to be statistically not significant for the degree of freedom 1

and 14 at 0.05 level of confidence. The results clearly indicated that the cardio respiratory endurance of the control group had not been improved.

Figure shows the pre and post test means of experimental group and control group on speed, agility and cardio respiratory endurance



DISCUSSION AND FINDINGS

The present study experimented the effects of circuit training on selected physical fitness components among college level men hockey players. The results of this study indicated that circuit training improved speed, agility, and cardio respiratory endurance. The findings of the present study had similarity with the findings of the investigators referred in this study. Vega , et al, (2013). circuit training program was effective to increase and maintain both muscular and cardio respiratory endurance among school children. This could help physical education teachers design programs that permit students to maintain fit muscular and cardio respiratory endurance levels. Manohar (2011) additional circuit training will be benefit in improving the performance of the students undergoing training in the following events cardiovascular endurance, vertical jumping ability, agility and muscular endurance. Taşkin (2009), circuit training, performed 3 days a week during 10 weeks of training, improves sprint-agility and anaerobic endurance. Manickam (2013) circuit training improved strength and endurance parameter namely leg strength and strength endurance. Hofstetter et.al, (2011) circuit training session per week led to greater improvements in total physical fitness score, but did not increase injury rates. Sethy et.al,(2010) 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. Deeva et al., (2013) circuit training will be of any benefit in improving the performance of the students undergoing training in the following events cardiovascular endurance, vertical jumping ability, agility and muscular endurance. Dhanaraj (2014) improved physical fitness variables especially speed and agility of women Inter-collegiate hockey players. Nagamani et al., (2013) specific circuit training on the selected physical fitness variables of speed, agility and muscular endurance are significantly improving of collegiate women athletes.

From of result of the present study, it is speculated that the observed changes in speed, agility cardio respiratory endurance may properly designed circuit training which are suitable for men hockey players at college level.

CONCLUSIONS

Eight weeks of circuit training significantly improved the speed, agility and Cardio respiratory endurance and circuit training could be incorporated as a component in the training schedule for hockey players.

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