Effect of Aerobic Circuit Training on Strength Endurance and Breath Holding Time of College Men Basketball Players

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Abstract

The purpose of the study was to find out the effect of aerobic circuit training on strength endurance and breath holding time of college men basketball players. To achieve this purpose of the study, thirty college men basketball players from DRBCCC Hindu college and Hindustan college chennai, Tamilnadu were randomly selected as subjects and they were divided into two equal groups. Each group consisted of the fifteen subjects. Group I underwent aerobic circuit training for three days per week for twelve weeks and Group II acted as control group who did not participate in any special training apart from their regular curricular activities. The subjects were tested on strength endurance and breath holding time at prior to and immediately after the training period. The strength endurance was measured by sit-ups test and breath holding time was measured by holding the breath for maximum duration. The analysis of covariance (ANCOVA) was used to find out the significant difference if any, between groups on each selected criterion variables separately. In all the cases, .05 level of confidence was fixed to test the significance, which was considered as an appropriate. The results of the study indicated that the aerobic circuit training had significantly improved the strength endurance and breath holding time of college men basketball players.

Keywords: Aerobic circuit training, Strength endurance, Breath holding time.

Introduction

The modern world is a world of competition. In every phase of life, people have to face one or other kind of competition. In this competitive world sports and games occupy a unique position. It is the arena of friendly rivalry. Top class international sports meets are considered to be the international ambassadors of peace. Top nations in the world are trying for world supremacy in various sports and games. 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. Circuit training is probably the most common training regime used by wide variables of sports activities in order to improve performance. A circuit consists of a number of different stations at which the athlete performs a given exercise as many times as possible within a given time period. When the time is completed, the individual moves on to the next station and performs a different exercise for a similar period of time and so on around the various stations (Christopher and Hetty, 1986). The aim of Circuit Training is a progressive development of the muscular respiratory systems and also achieves all round fitness. Aerobic circuit training is a workout regimen that consists of multiple exercises completed one after the other with little rest in between. Circuit training

helps to keep the heart rate at an elevated level, which offers cardiovascular benefits. Training can include a combination of resistance and aerobic exercises into the circuit-training workout for building strength and endurance. Basketball is one of the most popular sports in the world as spectator sorts and in terms of player's participation. It is fast, quick aggressive and attractive. It is considered a strenuous game because the game demands a high degree of fitness, intelligence and an alert mind. Balance, relaxation and protection are the basic skills required for all the fundamental movements in basketball. The capacity of player in possession of the natural movements and mastery of fundamental movements will be a resource for mastering the game in which one involved.

Methodology

The purpose of the study was to find out the effect of aerobic circuit training on strength endurance and breath holding time of college men basketball players. To achieve this purpose of the study, thirty college men basketball players from DRBCCC Hindu College and Hindustan College Chennai, Tamilnadu were randomly selected as subjects and they were divided into two equal groups. Each group consisted of the fifteen subjects. Group I underwent aerobic circuit training for three days per week for twelve weeks and Group II acted as control group who did not participate in any special training apart from their regular curricular activities. The subjects were tested on strength endurance and breath holding time at prior to and immediately after the training period. The strength endurance was measured by sit-ups test and breath holding time was measured by holding the breath for maximum duration. The analysis of covariance (ANCOVA) was used to find out the significant difference if any, between groups on each selected criterion variables separately. In all the cases, .05 level of confidence was fixed to test the significance, which was considered as an appropriate.

Analysis of the Data

Strength Endurance

The analysis of covariance on strength endurance of aerobic circuit training group and control group are analysed and presented in Table - I.

Table - I

Analysis of Covariance on Strength Endurance of Aerobic Circuit Training Group and Control Group

Groups	Aerobic Circuit Training Group	Control Group	Source of Variance	Sum of Squares	df	Mean Squares	'F' ratio
Pre - test Mean S.D.	32.17 0.92	32.18 0.89	B W	61.27 1321.85	1 28	61.27 47.21	1.30
Post-test Mean S.D.	35.58 0.82	32.91 0.89	B W	92.85 128.53	1 28	92.85 4.59	20.23*
Adjusted Post - test Mean	34.89	32.88	B W	96.11 168.58	1 27	96.11 6.24	15.40*

* Significant .05 level of confidence.

(The table values required for significance at .05 level of confidence with df 1 and 28 and 1 and 27 were 4.20 and 4.21 respectively).

Table - I showed that the pre-test mean values of strength endurance for aerobic circuit training group and control group were 32.17 ± 0.92 and 32.18 ± 0.89 respectively. The obtained 'F' ratio value of 1.30 for pre test scores of aerobic circuit training group and control group on strength endurance was less than the required table value of 4.20 for significance with df 1 and 28 at .05 level of confidence.

The post-test mean values for strength endurance for aerobic circuit training group and control group were 35.58 ± 0.82 and 32.91 ± 0.89 respectively. The obtained 'F' ratio value of 20.23 for post-test scores of aerobic circuit training group and control group was greater than the required table value of 4.20 for significance with df 1 and 28 at .05 level of confidence.

The adjusted post-test mean values of strength endurance for aerobic circuit training group and control group were 34.89 and 32.88 respectively. The obtained 'F' ratio value of 15.40 for adjusted post-test scores of aerobic circuit training group and control group were greater than the required table value of 4.21 for significance with df 1 and 27 at .05 level of confidence.

The results of this study showed that there was a significant difference between aerobic circuit training group and control group on strength endurance.

Breath Holding Time

The analysis of covariance on breath holding time of aerobic circuit training group and control group are analysed and presented in Table - II.

Table- II

Analysis of Covariance on Breath Holding Time of Aerobic Circuit Training Group and Control Group

Groups	Aerobic Circuit Training Group	Control Group	Source of Variance	Sum of Squares	df	Mean Squares	'F' ratio
Pre - test Mean S.D.	57.45 3.99	57.47 3.05	B W	0.003 921.35	1 28	0.003 32.91	0.0001
Post-test Mean S.D.	61.22 4.12	56.02 4.56	B W	49.41 789.69	1 28	49.41 28.2	1.75
Adjusted Post - test Mean	60.46	56.01	B W	48.71 23.81	1 27	48.71 0.88	55.32*

* Significant .05 level of confidence.

(The table values required for significance at .05 level of confidence with df 1 and 28 and 1 and 27 were 4.20 and 4.21 respectively).

Table - II showed that the pre-test mean values of breath holding time for aerobic circuit training group and control group were 57.45 ± 3.99 and 57.47 ± 3.05 respectively. The obtained 'F' ratio value of 0.0001 for pre test scores of aerobic circuit training group and control group on breath holding time was less than the required table value of 4.20 for significance with df 1 and 28 at .05 level of confidence.

The post-test mean values for breath holding time for aerobic circuit training group and control group were 61.22 ± 4.12 and 56.02 ± 4.56 respectively. The obtained 'F' ratio value of 1.75 for post-test scores of aerobic circuit training group and control group was lesser than the required table value of 4.20 for significance with df 1 and 28 at .05 level of confidence.

The adjusted post-test mean values of breath holding time for aerobic circuit training group and control group were 60.46 and 56.01 respectively. The obtained 'F' ratio value of 55.32 for adjusted post-test scores of aerobic circuit training group and control group were greater than the required table value of 4.21 for significance with df 1 and 27 at .05 level of confidence.

The results of this study showed that there was a significant difference between aerobic circuit training group and control group on breath holding time.

Discussion and Conclusion

According to Mosher et al.,(1994) point out that the aerobic circuit training programme is an effective way to improve cardio vascular fitness and muscular strength in college women. These findings are also in agreement with the results of Vaithiyanathan, (1988) circuit training after twelve weeks had significant effect of increasing muscular strength and muscular endurance. Hence it is concluded from the results of the present study, the specifically designed aerobic circuit training exercises are highly relevant to the selected criterion variables. So that the aerobic circuit training may influence strength endurance and breath holding time.

The results of the study showed that there was a significant difference between aerobic circuit training group and control group on strength endurance and breath holding time of men basketball players. It was also found that there was a significant improvement on strength endurance and breath holding time due to twelve-week aerobic circuit training.

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