



IMPACT OF CIRCUIT TRAINING WITH DIFFERENT FREQUENCIES AND DURATIONS ON VITAL CAPACITY OF SCHOOL STUDENTS

Physical Education

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ABSTRACT

The purpose of the present investigation is to examine the impact of circuit training with different frequencies and durations on vital capacity of school students. To achieve the purpose of this study, sixty school boys from various schools at Sivakasi, Tamilnadu, India, were selected as subjects. The age, height and weight of the subjects ranged from 15 to 17 years, 150 to 160 centimeters and 40 to 50 kilograms respectively. They were divided into four groups; each group consisted of fifteen students. CT-Group-I were undergone thirty minutes circuit training three days in a week, CT-Group-II were undergone thirty minutes circuit training five days in a week, CT-Group-III were undergone forty five minutes circuit training three days in a week and CT-Group-IV were undergone forty five minutes circuit training five days in a week. The data collected analyzed by applying the analysis of covariance (ANCOVA). Since four 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 the cases level of confidence was fixed at 0.05 for significance. Result showed that the school student's vital capacity performance significantly improved due to different frequencies and durations of circuit training from the base level of the student's performance. And also among the four groups, the CT-Group-IV student's vital capacity performance was significantly improved comparing to other groups.

KEYWORDS

Circuit Training and Vital Capacity.

INTRODUCTION

Physical fitness and mental stability go one in one, as research suggests that although physical and aerobic activity wells ones physical potentials, it also helps with ones positive body icon and self esteem. Studies show that physical fitness helps develop positive body icon and self esteem, perceivable increased stress management, reduction of depression and anxiety as well as increase mood states and develop overall cognitive function. Circuit training is a form of body conditioning that occupies endurance training, resistance training, high-intensity aerobics, and exercises executed in a circuit, similar to high-intensity interval training. It targets strength building and muscular endurance. An exercise "circuit" is one completion of all set exercises in the program. When one circuit is completed, one begins the first exercise again for the next circuit. Conventionally, the time between exercises in circuit training is short and often with quick movement to the next exercise (Comyns, 2018). Circuit training in itself is not a form of exercise per set, but the way an exercise session is structured (Scholich, 1992). A circuit session consists of a series of exercises or stations performed in succession with minimal rest intervals in between. Routines can be developed purely for strength development or for enhancing endurance or some combination of the two.

METHODOLOGY

The purpose of the present investigation is to examine the impact of circuit training with different frequencies and durations on vital capacity of school students. To achieve the purpose of this study, sixty school boys from various schools at Sivakasi, Tamilnadu, India, were selected as subjects. The age, height and weight of the subjects ranged from 15 to 17 years, 150 to 160 centimeters and 40 to 50 kilograms respectively. They were divided into four groups; each group consisted of fifteen students. CT-Group-I were undergone thirty minutes circuit training three days in a week, CT-Group-II were undergone thirty minutes circuit training five days in a week, CT-Group-III were undergone forty five minutes circuit training three days in a week and CT-Group-IV were undergone forty five minutes circuit training five days in a week. The vital capacity was measured by spirometer test. The data collected analyzed by applying the analysis of covariance (ANCOVA). Since four 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 the cases level of confidence was fixed at 0.05 for significance.

TRAINING PROGRAMME

The training programmes were scheduled for one session a day for all the four circuit training groups.

twelve weeks, this training was executed in the 400m track the intensity of the training increased progressively across the weeks. Intensity based on the no of sets (2 to 4) and repetitions (4 to 7) with 8 exercises.

Group-II underwent 30 minutes circuit training for five days for twelve weeks, the intensity of the training increased progressively across the weeks. Intensity based on the no of sets (2 to 4) and repetitions (4 to 7) with 8 exercises.

Group-III underwent 30 minutes circuit training for three days for twelve weeks, this training was executed in the 400m track the intensity of the training increased progressively across the weeks. Intensity based on the no of sets (2 to 4) and repetitions (4 to 7) with 10 exercises.

Group-IV underwent 30 minutes circuit training for five days for twelve weeks, the intensity of the training increased progressively across the weeks. Intensity based on the no of sets (2 to 4) and repetitions (4 to 7) with 10 exercises.

Statistical Technique

The data collected from the four groups prior to and post experimentation were statistically analyzed to find out the significant difference if any, by applying the alaysis of covariance (ANCOVA). In all the cases statistical significance was fixed at 0.05 levels.

RESULTS

Table-1 Analysis Of Covariance Of Different Frequencies Of Circuit Training On Vital Capacity

	CT- Gro- up-I	CT- Grou- p-II	CT- Grou- p-III	CT- Group- IV	S O V	Sum of Square s	df	Mean squares	'F' ratio
Pre test	3.43	3.46	3.47	3.49	B	0.025	3	0.008	0.14
Mean									
SD	0.27	0.24	0.23	0.21	W	3.29	56	0.059	
Post test	3.64	3.88	3.78	4.01	B	1.08	3	0.36	6.97*
Mean									
SD	0.25	0.21	0.23	0.19	W	2.89	56	0.052	
Adjusted	3.66	3.88	3.78	3.98	B	0.80	3	0.26	26.80*
Post test									
Mean					W	0.82	55	0.01	

(The required table value for significance at 0.05 level of confidence with degrees of freedom 3 and 55 is 2.77 and degree of freedom 3 and 56 is 2.77)

*Significant at .05 level of confidence

The CT-Group-I, CT-Group-II, CT-Group-III, and CT-Group-IV pre

test mean values are 3.43, 3.46, 3.47 and 3.49 respectively on vital capacity. The brought out "F" value is 0.14 which is lower than the required table value of 2.77 (df3&56=2.77). It revealed that there were no significant differences among the various frequencies of circuit training (CT) groups on vital capacity.

The CT-Group-I, CT-Group-II, CT-Group-III, and CT-Group-IV post test mean values are 3.64, 3.88, 3.78 and 4.01 respectively on vital capacity. The brought out "F" value is 6.97 which is higher than the required table value of 2.77 (df3&56=2.77). It revealed that there were significant differences among the various frequencies of circuit training (CT) groups on vital capacity.

The adjusted post test mean value attained through ANCOVA statistics on vital capacity of the four different frequencies of circuit training (CT) groups are 3.66, 3.88, 3.78 and 3.98 respectively, since adjusted 'F' ratio value 26.80 on vital capacity of four circuit training groups is significant (df3&55=2.77). It is decisive that due to different frequencies of circuit training (12 weeks) the school students on vital capacity performance is remarkably raised from the base level.

Since, the adjusted post test 'F' ratio value is found to be significant the Scheffe's test was applied as post hoc test to decide the paired mean differences, and it is presented in table-2.

Table-2 Scheffe's Test - Different Frequencies Of Circuit Training On Vital Capacity

Adjusted Post Test Means				DM	CI
CT-Group-I	CT-Group-II	CT-Group-III	CT-Group-IV		
3.66	3.88			0.22*	0.10
3.66		3.78		0.12*	0.10
3.66			3.98	0.32*	0.10
	3.88	3.78		0.10*	0.10
	3.88		3.98	0.10*	0.10
		3.78	3.98	0.20*	0.10

*significant

The mean differences (MD) of CT-Group-I and CT-Group-II (0.22), CT-Group-I and CT-Group-III (0.12), CT-Group-I and CT-Group-IV (0.32), CT-Group-II and CT-Group-III (0.10), CT-Group-II and CT-Group-IV (0.10), CT-Group-III and CT-Group-IV (0.20), are higher than confidence interval (CI=0.10, (0.05 level) value on vital capacity. It shows the significant difference among the above groups on increasing their vital capacity. The school student vital capacity level significantly increased due to different frequencies of circuit training from the base level of the student's performance. And also among the four groups, the CT-Group-IV students vital capacity level was significantly improved comparing to other groups.

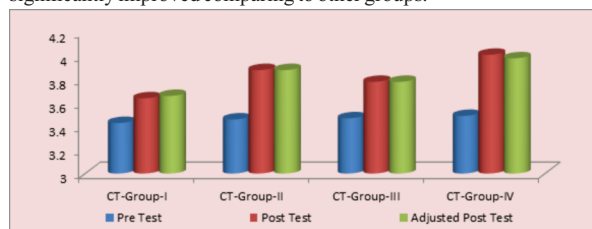


Figure – IX Diagram Showing That The Mean Value Of Different Frequencies Of Circuit Training On Vital Capacity

DISCUSSION

The result decisively showed on school student vital capacity level significantly increased due to different frequencies of circuit training from the base level of the student's performance. And also among the four groups, the CT-Group-IV students vital capacity level was significantly improved comparing to other groups. The below studies are supporting our study results.

Singh (2022) found out the influence of circuit training and interval training on Vital capacity and VO₂ Max in Basketball players. It was concluded that circuit training and interval training have significant positive increase on Vital capacity and VO₂ Max level.

Asath and Mohammed (2021) found out the effect of circuit training and plyometric training on resting pulse rate and vital capacity among

university level men handball players. The result of the study showed that there was a significant improvement was found in resting pulse rate and vital capacity among the experimental group when compared with control.

Shejin and Vivekanandhan (2020) examined the effects of circuit training program on obesity (% of body fat), Vital capacity and flexibility of the overweight and obese boy/male students. The results show that the training program has made significant impact on the dependent variables and it was found effective.

Muthuraj and Wise (2011) determined the effect of concurrent strength and endurance training and detraining on vital capacity. The concurrent strength and endurance training improved vital capacity (5.91%).

CONCLUSION

The conclusion of the study pointed out that the school student vital capacity performance significantly improved due to different frequencies and durations of circuit training from the base level of the student's performance. And also among the four groups, the CT-Group-IV students vital capacity performance was significantly improved comparing to other experimental groups.

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