International Journal of Physical Education, Sports and Health 2020; 7(5): 11-12

P-ISSN: 2394-1685
E-ISSN: 2394-1693
Impact Factor (ISRA): 5.38
IJPESH 2020; 7(5): 11-12

www.kheljournal.com
Received: 22-06-2020
Accepted: 20-08-2020

K Bala Murugan
Ph.D., Research Scholar, Department of Physical Education, Annamalai University, Chidambaram, Tamil Nadu, India

Dr. S Senthilvelan
Professor, Department of Physical Education, Annamalai University, Chidambaram, Tamil Nadu, India

Corresponding Author:
K Bala Murugan
Ph.D., Research Scholar, Department of Physical Education, Annamalai University, Chidambaram, Tamil Nadu, India

Effect of low and high intensity cardiac circuit exercises on inspiratory reserve volume and expiratory reserve volume among obese male students

K Bala Murugan and Dr. S Senthilvelan

Abstract
The purpose of present study was to find out the effect of low and high intensity cardiac circuit exercises on inspiratory reserve volume and expiratory reserve volume among obese male students. To achieve this purpose, forty five obese male students, studying in various classes and departments of Annamalai University, Annamalainagar, Chidambaram, Tamil Nadu, in the age group of 21 - 25 years were selected as subjects. The selected 45 subjects were divided into three equal groups, in which, group – I (n = 15) underwent low intensity cardiac circuit exercise with 50% of heart rate, group – II (n = 15) underwent high intensity cardiac circuit exercise with 60% of heart rate, group – III (n = 15) acted as control which did not participate in any special training. The training programme was carried three days per week for twelve weeks (alternative days). Prior to and after the training period the subjects were tested for inspiratory reserve volume and expiratory reserve volume. inspiratory reserve volume and expiratory reserve volume was measured by using expirograph. The collected data were statistically analyzed by using Analysis of Covariance (ANCOVA) and Scheffe̋'s Post-Hoc Test. The result of the study was a significant improvement on inspiratory reserve volume and expiratory reserve volume after twelve weeks of low and high intensity cardiac circuit exercises. However the increase was favour of experimental group. There was a significant difference was occurred between low, high intensity cardiac circuit exercises and control group after twelve weeks of low and high intensity cardiac circuit exercises.

Keywords: Obesity, intensity, cardiac circuit exercise, inspiratory reserve volume and expiratory reserve volume

Introduction
Obesity is a medical condition in which excess body fat has accumulated to the extent that it may have an adverse effect on health, leading to reduced life expectancy and/or increased health problems. People are considered as obese when their body mass (BMI), a measurement obtained by dividing a person's weight in kilograms by the square of the person's height in meters, exceeds 30 kg/m^2.

It is a metabolic disorder which is affecting the people throughout the world and commonly caused by a combination of excessive food energy intake, junk food, lack of physical activity, genetic susceptibility, and other psychological problems, although a few cases are caused primarily by genes, endocrine disorders, medications or psychiatric illness. The negative health (obesity) consequences are less or more insulin resistance, chances of occurring type 2 diabetes, asthma, hyper tension, increase in high total cholesterol, low density lipoproteins, triglycerides and lowering the triglycerides in blood, become sleep apnea, attaining early puberty, etc.

Indexes associated with high risk in obese persons often return to normal with appropriate physical activities, dietary habits, and a small weight loss even when body weight and percentage body fat remain above recommended amounts.

Circuit exercises is the most effective way to build muscles and improve cardio fitness, which makes it ideal for those who are overweight. Completing a circuit is no easy feat, as there is little or no rest between workouts, which means some level of fitness, is required.

Methodology

The purpose of present study was to find out the effect of low and high intensity cardiac circuit exercises on inspiratory reserve volume and expiratory reserve volume among obese male students. To achieve this purpose, forty five obese male students, studying in various classes and departments of Annamalai University, Annamalainagar, Chidambaram, Tamil Nadu, in the age group of 21 - 25 years were selected as subjects. The selected 45 subjects were divided into three equal groups, in which, group – I (n = 15) underwent low intensity cardiac circuit exercise with 50% of heart rate, group – II (n = 15) underwent high intensity cardiac circuit exercise with 55% of heart rate, group – III (n = 15) acted as control which did not participate in any special training. The training programme was carried three days per week for twelve weeks (alternative days). Prior to and after the training period the subjects were tested for inspiratory reserve volume and expiratory reserve volume. Inspiratory reserve volume and expiratory reserve volume was measured by using expirograph. The collected data were statistically analyzed by using Analysis of Covariance (ANCOVA). Further Scheffe's post hoc test was used to compare the means. The level of significance was fixed at 0.05.

Results

The data collected prior to and after the experimental periods on inspiratory reserve volume and expiratory reserve volume on low and high intensity cardiac circuit exercises and control group were analyzed and presented in the following table –1.

Table 1: Analysis of covariance for inspiratory reserve volume and expiratory reserve volume on low and high intensity cardiac circuit exercises and control group

Variable Name	Group Name	Control Group	Low intensity Group	High intensity Group	F ratio
Inspiratory reserve volume	Pre-test Mean ± S.D	2.62 ± 1.32	2.63 ± 1.82	2.63 ± 1.45	2.03
	Post-test Mean ± S.D.	2.64 ± 0.85	2.69 ± 1.52	2.78 ± 1.75	8.53*
	Adj. Post-test Mean ± S.D.	2.62	2.69	2.73	106.23
Expiratory reserve volume	Pre-test Mean ± S.D	2.54 ± 1.40	2.54 ± 1.65	2.54 ± 1.65	2.46
	Post-test Mean ± S.D.	2.56 ± 1.45	2.64 ± 1.99	2.78 ± 2.03	11.65*
	Adj. Post-test Mean ± S.D.	2.54	2.56	2.70	102.58

* Significant at .05 level of confidence.

* The table value required for significance at .05 level of confidence with df 1 and 43 and 1 and 42 were 3.21 and 3.22 respectively.

From the Table-1 it is clear that low and high intensity cardiac circuit exercises increases inspiratory reserve volume and expiratory reserve volume when compare with control group. Further to determine which of the paired means has a significant improvement, Scheffĕ *S* test was applied as post-hoc test. The result of the follow-up test is presented in Table – 2.

Table 2: Scheffĕ S Test for the Difference between the Adjusted Post-Test Mean of inspiratory reserve volume and expiratory reserve volume on low and high intensity cardiac circuit exercises and control group

Adjusted Post-test Mean of inspiratory reserve volume				
High intensity Group	**Low intensity Group**	**Control Group**	**Mean Difference**	**Confidence interval at .05 level**
2.73		2.62	0.21*	0.061
2.73	2.69		0.04	0.061
	2.69	2.62	0.07*	0.061
Adjusted Post-test Mean of expiratory reserve volume				
2.70		2.54	0.16*	0.057
2.70	2.56		0.14*	0.057
	2.56	2.54	0.02	0.057

* Significant at 0.05 level of confidence.

Both low and high cardiac circuit exercises increases inspiratory reserve volume and expiratory reserve volume when compare with control. High cardiac circuit exercises may have better effect to increases inspiratory reserve volume and expiratory reserve volume of obese adult.

Conclusions

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

1. There was a significant difference between low and high intensity cardiac circuit exercises on inspiratory reserve volume and expiratory reserve volume when compared with the control group.
2. The improvement in criterion variable such as inspiratory reserve volume and expiratory reserve volume was higher for the high intensity cardiac circuit exercises group than the low intensity cardiac circuit exercises group.

References

1. Haslam DW, James WP. Obesity. Lancet. 2005; 366:9492, 1197–209.
2. Retrieved from http://en.wikipedia.org/wiki/Obesity on 08-08-2012.
3. Retrieved from http://en.wikipedia.org/wiki/Obesity on 08-08-2012. Retrieved from http://en.wikipedia.org/wiki/Obesity on12/07/2014.
4. Retrieved from http://www.obesity.org/resources-for/childhood-overweight.htm on 15-07-2014.
5. Abernalthy RP, Black DR. Healthy Body Weights: an Alternative Perspective. American Journal of Clinical Nutrition, 1996; 63:448-451, 10-07-2017.