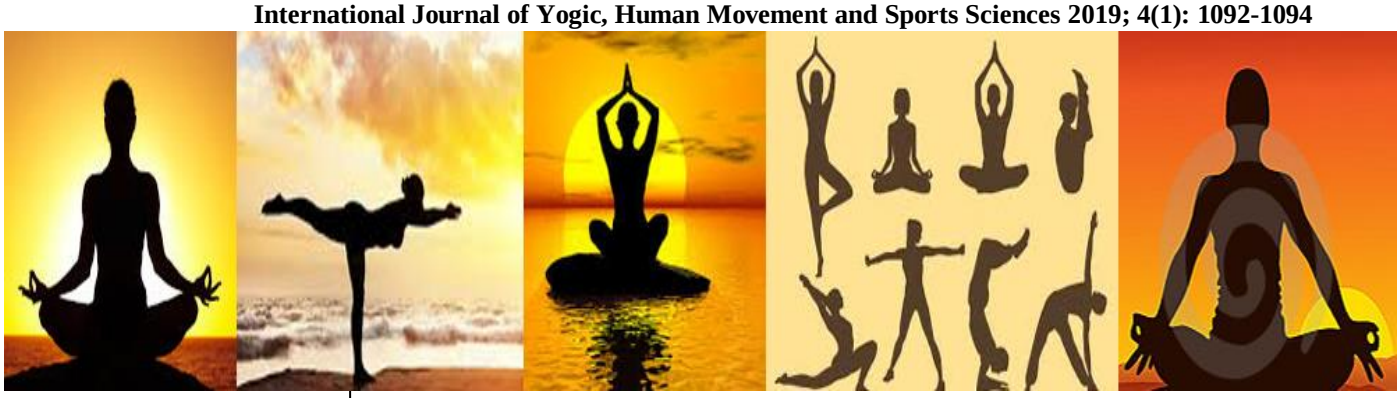
International Journal of Yogic, Human Movement and Sports Sciences 2019; 4(1): 1092-1094



ISSN: 2456-4419
Impact Factor: (RJIF): 5.18
Yoga 2019; 4(1): 1092-1094

www.theyogicjournal.com
Received: 28-11-2018
Accepted: 30-12-2018

Dr. A Subradeepan
Assistant Professor, Department of Physical Education, Annamalai University, Tamil Nadu, India

Correspondence
Dr. A Subradeepan
Assistant Professor, Department of Physical Education, Annamalai University, Tamil Nadu, India

Effects of aerobic training on VO_2 max of untrained students

Dr. A Subradeepan

Abstract
The purpose of the study was to investigate the effect of aerobic training on VO_2 Max of untrained students. Thirty male students from the Government Polytechnic College Nagarcoil were selected as subjects. The age, height and weight of the subjects ranged from 17 to 20 years, 162 to 170 centimeters and 56 to 65 kg respectively. The selected subjects were randomly assigned into two equal groups of 15 subjects each. Group I underwent aerobic training, group II acted as control. Prior to and after the training the subjects were tested on VO_2 Max using standard test and procedures. Analysis of covariance was used to determine the significantly difference existing between pre test and post test on VO_2 Max. The result of the study proved that the effect of aerobic training significantly increased on VO_2 Max of male untrained students.

Keywords: Aerobic training and VO_2 max

Introduction
Aerobic exercise is physical exercise that intends to improve the oxygen system. Aerobic means "with oxygen", and refers to the use of oxygen in the body's metabolic or energy-generating process. Many types of exercise are aerobic, and by definition are performed at moderate levels of intensity for extended periods of time. Aerobic can be viewed as an intricate system of bodily supply and demand. That is the body needs energy for any kind of activity and the need is filled by burning off the foods that eat. The majority medical opinion is that aerobic programs strengthen heart muscle, increase the efficiency of lungs and offer other wonderful benefits.

An aerobic exercise is any activity that can be sustained for at least 20 minutes at target heart rate**.** Activities like walking, running, swimming, and cycling require a great deal of oxygen to generate the energy needed for prolonged exercise. Aerobic training is exercise that involves or improves oxygen consumption by the body. Along with using and improving the body's oxygen consumption, aerobic training also increases the body's ability to burn fatty acids during an exercise session.

Aerobic exercise comprises innumerable forms. In general, it is performed at a moderate level of intensity over a relatively long period of time. For example, running a long distance at a moderate pace is an aerobic exercise, but sprinting is not. Playing singles tennis, with near-continuous motion, is generally considered aerobic activity, while golf or two person team tennis, with brief bursts of activity punctuated by more frequent breaks, may not be predominantly aerobic. Some sports are thus inherently "aerobic", while other aerobic exercises, such as fartlek training or aerobic dance classes, are designed specifically to improve aerobic capacity and fitness.

The best criterion of cardiorespiratory fitness is maximal oxygen uptake or aerobic power. VO_2 Max is measured in healthy persons during large muscle, dynamic activity (*e.g., walking, running, or cycling*). VO_2 Max is primarily limited by the oxygen transport capacity of the cardiovascular system (Mitchell & Blomqvist, 1971) [5]. VO_2 Max is most accurately determined by measuring expired air composition and respiratory volume during maximal exertion.

During exercise, VO_2 Max increases in direct proportion to the rate of work. The point at which a person's VO_2 Max is no longer able to increase is defined as the maximal oxygen

uptake VO_2 Max. A person's VO_2 Max is in part genetically determined; it can be increased through training until the point that the genetically possible maximum is reached (Jorgensen *et al*., 1977) [4].

Methodology

Subjects and Variables

The purpose of the study was to investigate the effect of aerobic training on VO_2 Max of untrained students. Thirty male students from the Government Polytechnic College Nagarcoil were selected as subjects. The age, height and weight of the subjects ranged from 17 to 20 years, 162 to 170 centimeters and 56 to 65 kg respectively. The selected subjects were randomly assigned into two equal groups of 15 subjects each. Group I underwent aerobic training, group II acted as control. Prior to and after the training the subjects were tested on VO_2 Max using standard test and procedures. Analysis of covariance was used to determine the significantly difference existing between pre test and post test on VO_2 Max.

Training Protocol

The training programmes were scheduled for one session a day each session lasted between thirty to forty five minutes approximately including warming up and warming down. During the training period, the experimental groups underwent aerobic training programme three days per week (alternative days) for twelve weeks in addition to their curriculum. The group–I aerobic training, the intensity starting from @ 50% of HRR to @ 65% HRR, followed from first week to twelve weeks.

Experimental Design and Statistical Technique

The experimental design in this study was random group design involving 30 subjects, who were divided at random in to two group of fifteen each. The pre test means of the selected dependent variable was used as a covariate. In order to nullify the initial differences the data collected from the four groups prior to and post experimentation on selected dependent variables were statistically analyzed to find out the significant difference if any, by applying the analysis of covariance (ANCOVA).

Table 1: Analysis of covariance on VO_2 max of experimental and control groups

	Aerobic Training Group	Control Group	SOV	Sum of Squares	df	Mean squares	'F' ratio
Pre test Mean	2.89	2.92	B	0.009	1	0.009	0.32
SD	0.15	0.18	W	0.82	28	0.029	
Post test Mean	3.39	2.87	B	2.01	1	2.01	26.75*
SD	0.17	0.34	W	2.10	28	0.07	
Adjusted Post test Mean	3.39	2.87	B	2.08	1	2.08	28.22*
			W	1.99	27	0.07	

*Significant at .05 level of confidence

(The required table value for significance at 0.05 level of confidence with degrees of freedom 1 and 27 is 4.21 and degree of freedom 1 and 28 is 4.20.).

Table-I showed that the pre test mean and standard deviation on VO_2 Max of aerobic training and control groups were 2.89 $\pm$ 0.15 and 2.92 $\pm$ 0.18 respectively. The obtained 'F' ratio value of 0.32 for pre test means on VO_2 Max of aerobic training and control groups were less than the required table value of 4.20 for the degrees of freedom 1 and 28 at 0.05 level of confidence. It revealed that there is statistically insignificant difference between the aerobic training and control groups during pre test period. It was inferred that the random assignment of the subjects for the two groups was successful.

The post test mean and standard deviation on VO_2 Max of aerobic training and control groups are 3.39 $\pm$ 0.17 and 2.87 $\pm$ 0.34 respectively. The obtained 'F' ratio value of 26.75 for post test means on VO_2 Max of aerobic training and control groups are greater than the required table value of 4.20 for the degrees of freedom 1 and 28 at 0.05 level of confidence.

The adjusted post test means on VO_2 Max of aerobic training and control groups are 3.39 and 2.87 respectively. The obtained 'F' ratio value of 28.22 on VO_2 Max were greater than the required table value of 4.21 for the degrees of freedom 1 and 27 at 0.05 level of confidence. It was observed from this finding that significant differences existed among the adjusted post test means of experimental and control groups on VO_2 Max.

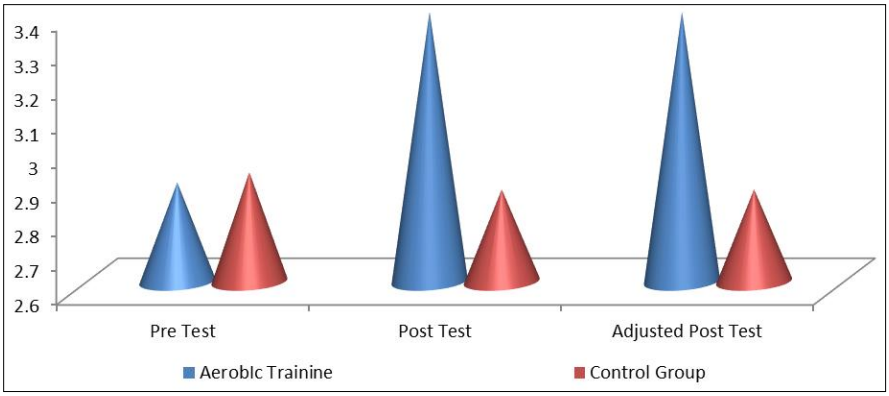


Fig 1: Cone diagram of the data on VO_2 max of experimental and control groups.

Discussion

The result of the present study indicates that aerobic training increased on VO_2 Max of untrained male students. These findings are similar to the study conducted by Hickson and colleagues (1997) [3] noted that VO_2 Max was continuing to increase at the end of the 10-week training program. Elite

endurance athletes typically have a high VO_2 Max and for the most part, it seems to be genetically determined (Daniels, 1989) [2]. A goal of any endurance-training program is to help the athlete reach their genetic upper limit for aerobic power in untrained individuals VO_2 Max improved by as much as 20% (Costill, *et al*., 1979) [1].

Conclusions

The conclusion of the study stated that the twelve weeks of aerobic training induced to increase on VO_2 Max of untrained male students.

References

1. Costill DL, Fink WJ. Pollock ML. Muscle fibre composition and enzyme activities of elite distance runners. Med Sci Sports. 1979; 8:96-102.
2. Daniels J. Training Distance Runners - a Primer. Gatorade Sports Sci. Exch. 1989; 1:1-5.
3. Hickson RC, Bomze HA, Holloszy JO. Linear increase in aerobic power induced by a strenuous program of endurance exercise. J Appl Physiol Respirat Environ Exercise Physiol. 1997; 42:372-376.
4. Jorgensen CR, Gobel FL, Taylor HL, Wang Y. Myocardial blood flow and oxygen consumption during exercise. Annals of the New York Academy of Sciences, 1977; 301:213-223.
5. Mitchell JH, Blomqvist G. Maximal oxygen uptake. New England Journal of Medicine. 1971; 284:1018-1022.