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## Effect of eight weeks aerobic exercises on physical and physiological variables among college men

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### Abstract

**Purpose:** The Purpose of the study was to find out the effect of aerobic training on selected physical and physiological variables.

**Selection of Subjects:** For the present study 30 male students from Dadapatil Rajale Arts and Science College, Adinathnagar. were selected randomly as the subjects for the study. The age of the subjects ranged between 18 - 21 years.

**Selection of Variables:** The variables selected for the present study were aerobic training (independent variable), muscular endurance, cardio-respiratory endurance, Resting Heart Rate and Vital Capacity.

**Methodology:** For the study pre test – post test randomized group design, The subjects were further classified at random into two equal groups. Group - I underwent aerobic exercises for five days per week for eight weeks experimental group (15 students) and group - II acted as control group (15 students) was used. The data were collected through the pre test, before training and post test, after eight weeks of aerobic exercises training.

**Statistical Technique:** For comparing pre and post test means of experimental and control groups of selected physiological variables, descriptive analysis and Analysis of Co-Variance (ANCOVA) were used, the data analyzed with the help of SPSS (16.0 version) software and the level of significance was set at 0.05 level of confidence.

**Result:** The result of the study showed that there was significant difference between pre and post test (experimental group) of muscular endurance, cardio-respiratory endurance, Resting Heart Rate and Vital Capacity, Another hand there was insignificant difference between pre and post test (control group) of muscular endurance, cardio-respiratory endurance, Resting Heart Rate and Vital Capacity.

**Conclusion:** On the basis of the findings it was concluded that the aerobic training might be responsible for the improvement of selected physical and physiological variables. Like muscular endurance, cardio-respiratory endurance, Resting Heart Rate, Vital Capacity (VC).

**Keywords:** aerobic training, physiological variables, muscular endurance, cardio-respiratory endurance, resting heart rate, vital capacity.

### 1. Introduction

Fundamental movements of man, which they have achieved from their pre-human ancestors, are walking, running, jumping, climbing, throwing, pulling, pushing etc. By permutation and combination of these basic fundamental movements, man has developed various secondary movements essential for day-to-day living and for the use in games and sports. Physical fitness is important for all human beings, irrespective of their age. A given work may not be carried out if the required physical strength is not available. Fitness is the first and foremost thing to enjoy the life fully (Reddy, 2012) <sup>[10]</sup>.

Regular physical activity, fitness, and exercise are critically important for the health and wellbeing of people of all, whether they participate in vigorous exercise or some type of moderate health-enhancing physical activity. Even among frail and very old adults, mobility and functioning can be improved through physical activity (Butler *et al.*, 1998) <sup>[11]</sup>.

Regular aerobic exercise will produce beneficial effects for any age group providing the exercise is specific and appropriate to the level of fitness of the individual. Progressive exercise correctly performed will increase the level of fitness and improve health. It will also create a sense of well-being, produce greater energy and reduce the risk of developing many diseases.

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Exercise makes demands on the body systems over and above normal every day activities and as result the systems adapt anatomically and physiologically (Rosser, 2001) [12].

Sports activities are classified into several areas such as performance sports, physical education, rehabilitation sports, fitness, leisure sports and adventure sports. Each area of sports caters to the requirements and demands of a particular section of the society. The area of performance sports has gained much more publicity and importance than the other areas. During the past twenty years great deals of evidences have been reported by the medical researches supporting the value of vigorous exercise for the promotion of health. Health-related physical fitness components are those, development of which enrich one's health and on the other hand which are related to certain diseases. (Baumgartner and Jackson, 1987) [6].

The word aerobic, meaning with oxygen, to represent idea, even so the dynamics of the idea are more complicated than implied by the definition. 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 we eat. Aerobic programs strengthen heart muscle, increase the efficiency of lungs and offer other wonderful benefits.

Aerobic refers to a variety of exercise that stimulates heart and lung activity for a time period sufficiently long to produce beneficial change in the body. Aerobics or endurance exercises are those in which large muscle groups are used in rhythmic repetitive fashion for prolonged periods of time.

By doing aerobics, the whole body is used and major muscle groups including legs, trunk and arm get involved. In aerobic exercise the heart rate increases substantially, but never reaches its maximum level. The heart is always able to deliver sufficient oxygen rich blood to muscles so that they can derive energy from fat and glycogen aerobically. Aerobic exercise builds stamina for sports and it also is the most important form of exercise for health, since it increases the efficiency of heart, circulation and muscles. Aerobic exercise is the keystone of fitness, by doing aerobics; it increases the capillary network in the body. Aerobics is a progressive physical conditioning programmer that stimulates respiratory activity for a time period sufficiently long to produce beneficial changes in the body.

Many research studies says physical exercise are important for the development of all physical fitness but no research was done in men health related physical fitness problems. Now a days in our country because of sedentary life style most people are attacked by chronic disease such as; coronary heart disease, hypertension, diabetes, and Some other upcoming diseases. According to many research studies finding physical inactivity is one of the causes for development of chronic disease and poor fitness. Similarly, in people are living sedentary lifestyle due to poor culture of having regular physical exercise. Therefore. The research investigated the effect of aerobic training on selected physical and physiological variables.

## 2. Methodology

### 2.1 Selection of Subjects

The purpose of the study was to find out the effect of eight weeks aerobic exercise on selected physical and physiological variables among College men. To achieve this purpose, 30 male students studying in Dadapatil Rajale Arts and Science College, Adinathnager were randomly selected as subjects. The age of the subjects were ranged from 18 to 21 years. The

subjects were further classified at random into two equal groups of 15 subjects each. Group - I underwent aerobic exercises for five days per week for eight weeks and group - II acted as control.

### 2.2 Selection of Variables

The subjects were assessed on selected criterion variables namely

1. Aerobic exercise training (Independent variables)
  - Physical variables (dependent variables)
    1. muscular endurance (ME)
    2. cardio respiratory endurance (CE)
  - Physiological variables (Dependent variables)
    1. Resting heart rate (RHR)
    2. Vital capacity (VC)

### 2.3 Criterion Measures

Before and after the training period. The selected variables were measured by using standard testing procedures.

1. Muscular Endurance was measured by Sit ups Test and recorded in number.
2. Cardio respiratory Endurance was measured by Coopers 12 Minutes run and recorded in meter.
3. Resting Heart rate was measured by gently pressing over the radial artery and recorded in numbers for one minute by using stop watch.
4. Vital capacity was measured by Dry Spirometer and recorded in milliliters.

### 2.4 Experimental Design

For the study pre test & post test randomized group design, which consists of one control group (n=15) and one experimental group (n=15) was used. Equal numbers of subjects were assigned randomly to the group. One group served as experimental group (Aerobic exercises training group) on which treatment was assigned and the second group served as the control group.

**Table 1:** Pre Test & Post Test Randomized Group Design

Aerobic exercise training group	O1	T	O2
Control group	O1		O2

Where- O1 = Pre Observation, O2= Post Observation and T=Treatment (training).

### 2.5 Collection of data

Before the administration of aerobic training, the selected tests for selected physical and physiological variables were administered on both the experimental and control groups to collect pretest data. After the completion of eight weeks of aerobic exercises training again the same tests were conducted to collect the post training data. Necessary instructions were given to the subjects before administration of the tests.

### 2.6 Administration of training

The training for experimental group was administered at Dadapatil Rajale Arts and Science College, Adinathnager. Selected aerobic exercises (Walking, Jogging, Running, Jumping, Stair Running, Rhythmic Exercises, Slow Stretching etc.) were given to experimental group on five days i.e. (Monday to Friday) sessions per week for eight weeks. Each training session consisted of 60-90 minutes included 10-15 minutes of warming up and 10-15 minutes for cooling down. Remaining minutes allotted for aerobic exercise training programmer.

## 2.7 Statistical Procedure

The data were analyzed by applying descriptive statistical and Analysis of Co-Variance (ANCOVA). The data analyzed with the help of SPSS (16.0 version) software and the level of significance was set at 0.05 level of confidence.

## 3. Result and Findings of the Study

The Analysis of covariance on muscular endurance, cardio respiratory endurance, resting heart rate and Vital capacity of the pretest and post test scores of aerobic exercise and control group have been analyzed and presented in Table 1.

**Table 2:** Analysis of co variance on selected variables among aerobic exercise and control groups

Variable name	Group Name	Control Group	Aerobic exercise group	'F' Ratio
Muscular endurance	Pre-test Mean $\pm$ S.D	33.85 $\pm$ 3.94	33.30 $\pm$ 4.31	0.178
	Post-test Mean $\pm$ S.D.	34.45 $\pm$ 3.83	40.25 $\pm$ 4.25	20.53*
	Adj. Post-test Mean	34.18	40.52	864.84*
Cardio respiratory endurance	Pre-test Mean $\pm$ S.D	1888.50 $\pm$ 115.95	1883.50 $\pm$ 114.03	.019
	Post-test Mean $\pm$ S.D.	1886.50 $\pm$ 117.62	2017.50 $\pm$ 109.68	13.27*
	Adj. Post-test Mean	1884.09	2019.92	304.30*
Resting Heart rate	Pre-test Mean $\pm$ S.D	75.73 $\pm$ 7.87	74.33 $\pm$ 4.70	.350
	Post-test Mean $\pm$ S.D.	74.80 $\pm$ 6.37	69.33 $\pm$ 4.15	7.750*
	Adj. Post-test Mean	74.31	69.83	17.655*
Vital capacity	Pre-test Mean $\pm$ S.D	3.469 $\pm$ .6113	3.7640 $\pm$ .3878	2.485
	Post-test Mean $\pm$ S.D.	3.469 $\pm$ .6113	4.2920 $\pm$ .4863	15.875*
	Adj. Post-test Mean	3.627	4.147	31.410*

\*significant at 0.05 level,  $F_{0.05}(1, 38) = 4.098$ ,  $F_{0.05}(1, 37) = 4.107$ .

Above table shows that the adjusted post-test means on muscular endurance of control group and aerobic exercise group are 34.18 and 40.52 respectively. The obtained 'F' ratio value of 864.84 of adjusted post-test data on muscular endurance is greater than the required table value of 4.107 for significance at 0.05 level of confidence with degree of freedom 1 and 37.

The adjusted post-test means on cardio respiratory endurance of control group and aerobic exercise group are 1884.09 and 2019.92 respectively. The obtained 'F' ratio value of 304.30 of adjusted post-test data on cardio respiratory endurance is greater than the required table value of 4.107 for significance at 0.05 level of confidence with degree of freedom 1 and 37.

The adjusted post-test means on resting heart rate of control group and aerobic exercise group are 74.31 and 69.83 respectively. The obtained 'F' ratio value of 17.655 of adjusted post-test data on resting heart rate is greater than the required table value of 4.107 for significance at 0.05 level of confidence with degree of freedom 1 and 37.

The adjusted post-test means on vital capacity of control group and aerobic exercise group are 3.627 and 4.147 respectively. The obtained 'F' ratio value of 31.410 of adjusted post-test data on resting heart rate is greater than the required table value of 4.107 for significance at 0.05 level of confidence with degree of freedom 1 and 37.

The results of the study showed that there was significant difference among the adjusted post-test means of control group and aerobic exercise group.

## 4. Discussion

The findings of the study shows that significant difference exists between aerobic training and control group on muscular endurance, cardio respiratory endurance, resting heart rate and vital capacity. Recent work shows that the cardiovascular adaptations occur as a result of endurance training (Helgerud *et al.*, 2007; Wisløff, Ellingsen, & Kemi, 2009) [7]. Regular participation in aerobic exercise often results in a decrease in resting heart rate (Katona PC, *et al.*, 1982 & Smith ML, *et al.*, 1989) [3, 9] Similar study conducted by (M. Muralikrishna & P.V. Shelvam, 2014) [4] on Effect of different intensities of aerobic training on vital capacity of middle aged obese men; The results showed that High intensity aerobic training positively influences the cardiopulmonary (vital capacity) (R.

Muthu Eleckuvan, 2014) [5]. The result of the study shows that aerobic exercise has its influence in the selected physical and physiological variables among College men.

## 5. Conclusions

On the basis of findings of the study, the following conclusions may be drawn:

1. The results of the study indicate that the significant difference was found in pre and post test of (experimental group) Muscular endurance, ( $p < 0.05$ ).
2. The results of the study indicate that the insignificant difference was found in pre and post test of (control group) Muscular endurance, ( $p > 0.05$ ).
3. The results of the study indicate that the significant difference was found in pre and post test of (experimental group) Cardio respiratory endurance, ( $p < 0.05$ ).
4. The results of the study indicate that the insignificant difference was found in pre and post test of (control group) Cardio respiratory endurance, ( $p > 0.05$ ).
5. The results of the study indicate that the significant difference was found in pre and post test of (experimental group) resting heart rate, ( $p < 0.05$ ).
6. The results of the study indicate that the insignificant difference was found in pre and post test of (control group) resting heart rate, ( $p > 0.05$ ).
7. The results of the study indicate that the significant difference was found in pre and post test of (experimental group) vital capacity, ( $p < 0.05$ ).
8. The results of the study indicate that the insignificant difference was found in pre and post test of (control group) vital capacity, ( $p > 0.05$ ).

On the basis of the findings it was concluded that the eight weeks aerobic training is responsible for the improvement of selected physical and physiological variables like Muscular endurance, Cardio respiratory endurance Resting Heart Rate, Vital Capacity.

## 6. References

1. Gossard D, Haskell WL, Taylor CB, Mueller JK, Rogers F, Chandler M. Effects of Low-and High-Intensity Homebased Exercise Training on Functional Capacity in Healthy Middle-age Men. American Journal of Cardiology. 1986; 57:446-449.

2. Kansal DK. Text book of Applied Measurement, Evaluation and Sports Selection. New Delhi, India: Sport and Spiritual Science Publication, 2008.
3. Katona PC, McLean M, Dighton DH, Guz A. Sympathetic and Parasympathetic Cardiac Control in Athletes and Non-athletes at Rest. *Journal of Applied Physiology*. 1982; 52:1652-1657.
4. Muralikrishna M, Shelvam PV. Effect of different intensities of aerobic training on vital capacity of middle aged obese men. *International journal of current research and academic review*. 2014; 2(8):85-90.
5. Eleckuvan MR. Effectiveness of Fartlek Training on Maximum Oxygen Consumption and Resting Pulse Rate. *International Journal of Physical Education, Fitness and Sports*. 2014; 3(1):85-88.
6. Ted A, Baumgartner TA, Jackson AS. *Measurement for Evaluation in Physical Education and Exercise Science* (3rd edition; Dubeque, Iowa: W.Mc. Brown Publishers), 1987, 11.
7. Gutin B. Defining Health and Fitness: First Step toward establishing children's fitness standards. *Research Quarterly*, 1992; 63(2):128-132.
8. Helgerud J, Høydal K, Wang E, Karlsen T, Berg P *et al*. Aerobic high-intensity intervals improve VO<sub>2</sub>max more than moderate training. *Medicine and Science in Sports and Exercise*. 2007; 39(4): 665-671.
9. Smith ML, Hudson DL, Graitzer HM, Raven PB. Exercise Training Bradycardia: The Role of Autonomic Balance. *Medicine and Science in Sports and Exercise*, 1989; 21:40-44.
10. Reddy M. Comparison of Circuit Training Methods on Performance Variables of Sc/St Non-Sc/St Boys. *International Journal of Multidisciplinary Research*. 2012; 2(4):2231 -5780
11. Butler RN, Davis R, Lewis CB. Physical fitness: benefits of exercising for the older patient. *Geriatrics*. 1998; 3(10):46-62.
12. Rosser M. *Body Fitness and exercises*. (2nd edition). 2001, 32.