

Effect of Aerobic Exercises on Vital Capacity and Body Mass Index of Adults

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Abstract:

The article discusses the research conducted at a school in India which explores the impact of aerobic exercises on the body mass index and vigour vitality of adults. The experiment utilized a random sampling method and divided 30 adults into experimental group and control group. Activities are noted for the 6-week training program which include walking, running and cycling.

Key words: Aerobic, Body Mass, adults, training

1. INTRODUCTION

Physical fitness is the natural outcome of rich programme of physical education. It is the sum of the condition of one's body judged in terms of age, height, weight and chest expansion in terms of freedom from diseases, constitutional affection or bodily infirmity. Full physical development, vigour, vitality and radiant health should be seen in one who is physically fit. In terms of usefulness, physical fitness has been defined as "total functional capacity of an individual to perform a given task [1-8].

Since physical education has been particularly concerned with the character development aspect of games and sports, no one would doubt that sports are a special type of games. Which was defined by Lay as "Any form of playful competition whose outcome is determined by physical skill, strategy or chance employed singly or in combination" [9-13].

Aerobic Exercise

Aerobic exercise is physical exercise of relatively low intensity and long duration, which depends primarily on the aerobic energy 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.

Physical Fitness

The concept of physical fitness has become a point of attention in our country. The Govt. as well as the people are becoming aware of its importance in present day living because fitness is essential to increase productivity power of labor in every respect of development. Various schemes have been launched by the Govt. of India to improve physical fitness of its citizen and to create interest among the people towards such activities which may ultimately improve their fitness. Man's personality is the total picture of his organized behavior. For the development of personality, the individual should be physically fit, mentally alert, emotionally matured and socially adjusted.

1.1 Statement of the Problem

The researcher is the student of physical education and is well aware that exercises play a very important role in maintaining the physical fitness of an individual. Also the researcher has a little bit knowledge about the aerobic exercise. The researcher used to check the effect of aerobic exercise on physical fitness of adults. All these created interest in the researcher. Under taken the problem title on "*Effect of Aerobic Exercises on vital capacity and body mass index of Adults*".

1.2 objective of the Study

The objective of the study is as follows:

1. To assess the effect of aerobic training on vital capacity and body mass index

1.3 Significance of the Study

The study would be significant in the following aspects-

- i) The result of this study may help the adults to know the aerobic effect on physical fitness.
- ii) To devise specific aerobic training programme for adults.

1.4 Hypothesis

Researcher hypothesized that; there would be significant difference as a result of aerobic exercise on vital capacity and Body mass index of adults

1.5 Delimitation

1. The study was delimited to the 30 adults of Yavatmal city.

- ii. The age of subjects was ranging between 18 to 25 years.
- iii. The study was confined only to the general aerobic exercises.
- iv. The study was further delimited to physical fitness variables i.e. Vital capacity, Body Mass Index (Height & Weight).

1.6 Limitation

- i. The daily routine life of the subjects was not considered.
- ii. Other physical activities by the subject which was not taken under the control of scholar.
- iii. Control on diet of the subjects was not taken under the control of scholar.
- iv. Medical treatment on the subjects was not considered.

2. METHODOLOGY

This chapter includes the information regarding selection of subjects; sources of data, sampling procedures, selection of test, criterion measures, collection of data and administration of test have been described.

2.1 Selection of Subjects

30 adults were selected as subjects from Yavatmal city and their age was ranging between 18 to 25 years.

2.2 Sampling Procedure

Simple random sampling method was employed for the selection of subjects for the study.

2.3 Formation of Groups

The researcher divided the 30 adults into two equal groups on the basis of the mean performance of pre-test score. The groups were equated and distributed into two homogeneous groups namely.

- 1) Experimental Group
- 2) Control Group

2.4 Criterion Measures

Following criterion measures was selected for testing the hypothesis on present study.

- 1. Vital Capacity
- 2. Body Mass Index

2.5 Administration of the Test

3) Vital Capacity:

Purpose: To measure the Vital Capacity.

Instrument: Dry spirometer

Procedure:

After a couple of normal breath the subject was asked to take a deep breath and exhale into spirometer as forcefully as possible.

Scoring: The highest of the three consecutive trials with rest of one minute after each trial was recorded in the unit of liter.

4) Body Mass Index:

- a) **Weight** - Total body weight was recorded in Kg by using standard weighing machine.
- b) **Height** - Height was recorded in centimeters and converted into meters by using Wall Scale.

$$\text{Body Mass Index (BMI)} = \frac{\text{Body Weight (Kg)}}{(\text{Standard Height in Meter})^2}$$

Purpose: To measure the Body Mass Index of the subjects.

Instruments: Calibrated weighing machine.

Procedure: The weight of the subject was taken by laboratory anthropometric weighing machine. The subject wearing shorts and vest only stood at the center of the machine and the weight was recorded from the indicator needle of the dial.

Scoring: The weight was recorded in kilograms.

2.6 Training Program

6 Week Training Program

Week	Aerobic Exercise & Duration		Recovery	Total Volume
I & II Week	Walking	10 min	In every exercise 1 min rest	Approx. 40 min
	Slow Running	5 min		
	Running	5 min		
	Cycling	5 min		
	Dancing	5 min		
III & IV Week	Walking	15 min	In every exercise 3 min rest	Approx. 1 Hr
	Slow Running	8 min		
	Running	8 min		
	Cycling	8 min		
	Dancing	8 min		
V & VI Week	Walking	20 min	In every exercise 5 min rest	Approx. 1 Hr 20 min
	Slow Running	10 min		
	Running	10 min		
	Cycling	10 min		
	Dancing	10 min		

Warm up and cool down was 15 min and 10 min on every day. Training program was 6 days in a week and on Sunday total rest.

2.7 Collection of Data

For data collection two test was conducted 1) Pre-test: A Pre-test was conducted for knowing the equal distribution of both the group ie. two Experimental groups and Control group. 2) Post-test: After six weeks training programmed final test was conducted for the final result collected pre-test and post test data was further put for analysis.

3. ANALYSIS AND INTERPRETATION OF DATA

The researcher conducted a study on effect of Aerobic exercises on Physical Fitness of Adults. For the purpose of this study the researcher collected data on 30 adults of Yavatmal city.

3.1 Analysis of Data

To determine the significant difference in the means of Physical Fitness adults between the two groups as well as between the pre-test and post test means of experimental and control group t-test was employed.

3.2 Level of Significance

To find out the significance difference, level of significance was set at 0.05 level of confidence. Findings of the statistical analysis have been shown in the following tables,

Table-1

Summary of Mean, Standard Deviation and t-ratio for the Data on Vital Capacity Between the Means of Pre and Post-tests of Control Group

Test	Mean	Standard Deviation	Mean Difference	Standard Error	t-ratio
Pre-test	968.133	28.693	8.934	10.153	0.880 [@]
Post-test	977.067	26.890			

@ Not significant at 0.05 level

Tabulated $t_{0.05 (14)} = 2.144$

The above table 3 show that, Vital Capacity mean difference between the pre-test and post-test of control group is not significant, because the calculated t-value of 0.880 is less than the tabulated t-value of 2.144 at 0.05 level of confidence of 14 degree of freedom.

Graphical Representation on Pre-Test, Post Test of Vital Capacity of control Group.

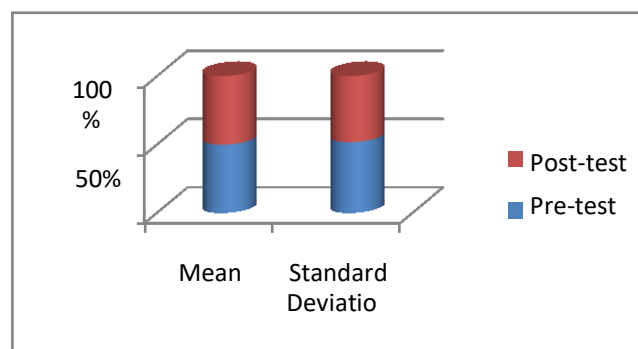


Table-2

Summary of Mean, Standard Deviation and t-ratio for the Data on Vital Capacity Between the Means of Pre and Post-tests of Experimental Group

Test	Mean	Standard Deviation	Mean Difference	Standard Error	t-ratio
Pre-test	968.867	22.013	27.333	8.114	3.369*
Post-test	996.200	22.425			

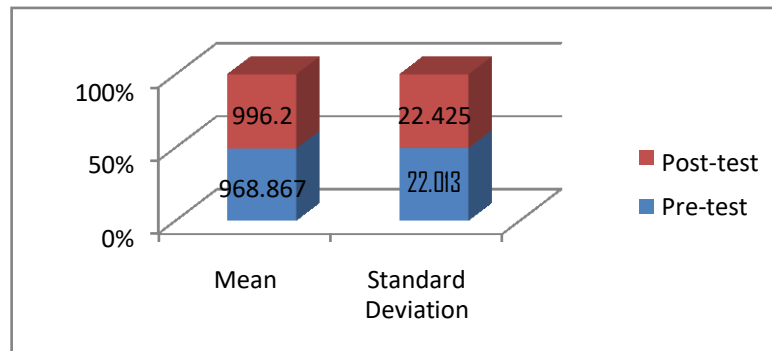
* Significant at 0.05 level

Tabulated $t_{0.05 (14)} = 2.144$

The above Table 7 show that, Vital Capacity mean difference between the pre-test and post-test of Experimental group is significant, because the calculated t-value of 3.369 is greater than the tabulated t-value of 2.144 at 0.05 level of confidence of 14 degree of freedom.

Graphical Representation on

Pre-Test, Post Test of Vital Capacity of Experimental Group.

**Table-3**

Summary of Mean, Standard Deviation and t-ratio for the Data on Body Mass Index Between the Means of Pre and Post-tests of Control Group

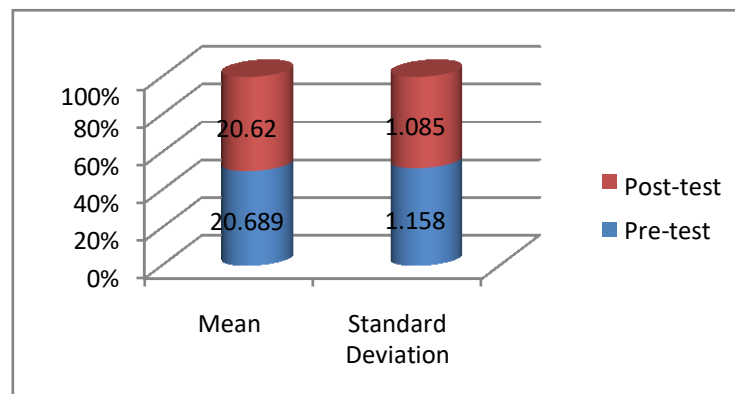
Test	Mean	Standard Deviation	Mean Difference	Standard Error	t-ratio
Pre-test	20.689	1.158	0.069	0.410	0.167@
Post-test	20.620	1.085			

@ Not significant at 0.05 level

Tabulated $t_{0.05 (14)} = 2.144$

The above table 3 show that, Body Mass Index mean difference between the pre-test and post-test of control group is not significant, because the calculated t-value of 0.167 is less than the tabulated t-value of 2.144 at 0.05 level of confidence of 14 degree of freedom.

Graphical Representation on Pre-Test, Post Test of Body mass index of Control Group.

**Table-4**

Summary of Mean, Standard Deviation and t-ratio for the Data on Body Mass Index Between the Means of Pre and Post-tests of Experimental Group

Test	Mean	Standard Deviation	Mean Difference	Standard Error	t-ratio
Pre-test	20.446	1.565	0.136	0.547	0.248@
Post-test	20.310	1.428			

@ Not significant at 0.05 level

Tabulated $t_{0.05 (14)} = 2.144$

The above Table 8 show that, Body Mass Index mean difference between the pre-test and post-test of Experimental group is not significant, because the calculated t-value of 0.248 is less than the tabulated t-value of 2.144 at 0.05 level of confidence of 14 degree of freedom.

4. DISCUSSION ON FINDINGS

- Insignificant difference found between pre test and post test of Control group in Vital Capacity ($t = 0.880$) and Body Mass Index ($t = 0.167$) because all t values are less than the tabulated t -value 2.144 at 0.05 level of confidence of 14 degree of freedom.
- Significant difference found between pre test and post test of Experimental group in Vital Capacity ($t = 3.369$) because all t values are less than the tabulated t -value 2.144 at 0.05 level of confidence of 14 degree of freedom. But Insignificant difference observed in Body Mass Index (tab $t_{0.05 (14)} = 2.144 > t = 0.248$).

➤ 4.4 Justification of Hypothesis

Researcher hypothesis stated earlier that, there would be significant difference as a result of aerobic exercise on vital capacity and body mass index of adults. From the above findings significant difference observed in a variables of vital capacity but not in Body Mass Index in pre and post test of Experimental group. . Hence the researcher stated hypothesis of vital capacity is accepted and body mass index is rejected.

5. CONCLUSION AND RECOMMENDATION

5.1 Conclusion

On the basis of findings the researcher concluded that,

- Insignificant difference found between pre test and post test of Control group in Cardio-vascular Endurance, Sit & Reach Test, Vital Capacity and Body Mass Index.
- Significant difference found between pre test and post test of Experimental group in Cardio-vascular Endurance, Sit & Reach Test and Vital Capacity, but insignificant difference observed in Body Mass Index.
- Significant difference examined between post test of Control and Experimental group in Cardio-vascular Endurance, Sit & Reach Test and Vital Capacity, but insignificant difference observed in Body Mass Index.

5.2 Recommendation

According to conclusion and findings the researcher gives some recommendations as-

- Training of aerobic exercise is effective on the Body mass index, and Vital Capacity.
- If we increase the duration of training programme may gives significant difference in Body Mass Index.
- Similar study may conduct on the girls also.
- Similar study may conduct on the players also.
- Similar study may conduct on different age groups.
- Similar study may conduct on different level of players.

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