

EFFECT OF AEROBIC EXERCISES ON SELECTED PHYSIOLOGICAL VARIABLES OF COLLEGE STUDENTS



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Abstract:

The main purpose of the present study was to find out the effect of aerobic exercises on selected physiological variables of college students in Yavatmal city of Maharashtra State. For this purpose 20-male students were selected from Bachelor of Physical Education (B. P. Ed.) Class from Dr. Babasaheb Nandurkar College of Physical Education Yavatmal., Using simple random sampling and the age group ranged between 21-25 years. All the subjects were taken from Dr. Babasaheb Nandurkar College of Physical Education Yavatmal. All the students were distributed into two groups one control (N=10) group and second experimental group (N=10). The experimental group was given 6-weeks training and no training was given to the control group. After 6-weeks training the results were statistically analyzed and the following conclusion was drawn. The study revealed that Aerobic training have a considerable effect on physiological variables however, there was a significant effect on Resting Heart Rate and Vital Capacity, Blood Pressure (systolic and diastolic) and Body Mass Index did not showed significant effect after 6-weeks aerobic training program.

Keywords: Aerobic Exercises, Selected Physiological Variables & College Students.

Introduction:

The promotion of sports is no longer a matter of dispute. The importance has been recognized at international level by all the countries of the world. Today sports is considered as an international disciple because, it develops international understanding and universal brotherhood. Sports are also one of the factors developing national character. Physical education and sports should form an integral part of life long education in the overall educational system and their promotion from pre-school age to old age should be treated as one of the fundamental right. Physical education which is commonly a part of the curriculum at junior/senior College includes training and maintaining one's physical body through educational means. It is also about sharpening overall cognitive abilities and motor skills via athletics, exercise and various other physical activities like martial arts and dance. Here are some of the benefits that highlight the importance of physical education. With obesity at an all time high, schools and universities alike are encouraging students to take part in activities that require physical involvement, be it in the form of exercise or sports. Some even come with their own fitness centres to give students a chance to enrol in their many programs. Campuses today that are conscious about such issues, stress on the importance of physical education by making sure students are constantly taking part

in different activities and sport functions. Here are the reasons why a child should be health-conscious at a younger age. Many people participate in sports and games for fun, happiness, pleasure for health and fitness. Increased participation in sports has resulted in competition which has become an important element of modern life. Competition provides the means by which one can show one's worth by competing successfully.

Aerobic Exercise:

Aerobic is the term coined by Dr. Kenneth H Cooper M.D. in 1968 who was an exercise Physiologist in U.S Air Force, HE did his first research in 1960s on over 5000 U.S. air force personals. He has since written 18 books and is named “the father of aerobics”. Aerobic exercises (also known as cardio) are physical exercise of relatively low intensity that depends primarily on the aerobic generating process. Aerobic literally means “living in air” and refers to meet energy demands during exercise via aerobic metabolism. Generally light to moderate intensity activities that are sufficiently supported by aerobic metabolism can be performed for extended period of time. The intensity should be between 60-85% of maximum heart rate.

Objective of the Study:

The main objective of the study was to find out the effect of aerobic exercises on selected physiological variables of college students.

Methodology:

For this study subjected were selected randomly from Bachelor of Physical Education (B. P. Ed.) Class from Dr. Babasaheb Nandurkar College of Physical Education Yavatmal., age of the students was between 21-25 years. Pre and post tests were administered on the subjects for measuring Resting Heart rate, Blood pressure (systolic and diastolic), Vital capacity and BMI. The aerobic training was employed for 6 weeks 6 days training in a week and one day a rest, 40 minutes of training session. The statistical tools of Mean, Standard Deviation and ‘t’ Test were used for analysis of data. The below tables show the analysis of data pertaining to the effect of aerobic exercises on the selected physiological variables (Resting Heart rate, Blood Pressure(systolic and diastolic), Vital capacity and BMI) of college level students.

Table No: 1

Resting Heart Rate between pre and post-Test of control group of age group of 18-25 years

Control Group	Mean	S.D	S.E. Comb.	M.D.	D.F.	C.T.	T.T.
Pre. Test	69.6	4.63	1.69	0.4	18	0.23	2.101
Post Test	69.2	2.7					

Level of Significance = 0.05.

Tabulated ‘t’ 0.05(18) = 2.101.

Table No: 1 reveals that there is no significant difference between means of pre and post tests of control group, because mean of pre test is 69.6 is slightly higher than mean of post test is 69.2 and there mean difference is 0.4. To check significant difference between pre and post test of control group the data was again analyzed by applying ‘t’ test. Before applying ‘t’ test, standard deviation was calculated between pre test where S.D. = 4.63 and after post test S.D. = 2.7 and their combined standard error = 1.69. therefore after applying ‘t’ test it was found that was no significant difference between pre and post tests of control group because value of calculated ‘t’ = 0.4 which is less than tabulated ‘t’ = 2.101 at 0.05 level of confidence, which shows that there is no improvement in control group before and after test because no training was given to the subjects of control group.

Table No: 2
Resting Heart Rate between pre and post-Test of Experimental group of age group of 18-25 years

Experimental Group	Mean	S.D	S.E. Comb.	M.D.	D.F.	C.T.	T.T.
Pre. Test	69.1	4.30					
Post Test	59.7	1.50	1.87	9.4	18	5.026	2.101

Level of Significance=0.05

Tabulated ‘t’_{0.05(18)}=2.101

Table No:- 2 reveals that there is a significant difference between means of pre and post tests of experimental group, because mean of pre test is 69.1 is higher than mean of post test 59.7 and there mean difference is 9.4. To check significant difference between pre and post test of experimental group the data was again analyzed by applying ‘t’ test. Before applying ‘t’ test, standard deviation was calculated between pre test where S.D. =4.30 and after post test S.D. = 1.50 and their combined standard error = 1.87. therefore after applying ‘t’ test it was found that there was a significant difference between pre and post tests of experimental group because value of calculated ‘t’ = 5.026 which is higher than tabulated ‘t’ = 2.101 at 0.05 level of confidence, which shows that there is significant effect on experimental group after six weeks aerobic training .

Graph-1

Graphical Representation of Mean Differences between Pre Tests and Post Tests of control and Experimental Group for Resting Heart Rate

Scale: Y-Axis: 1cm = 10 Mean

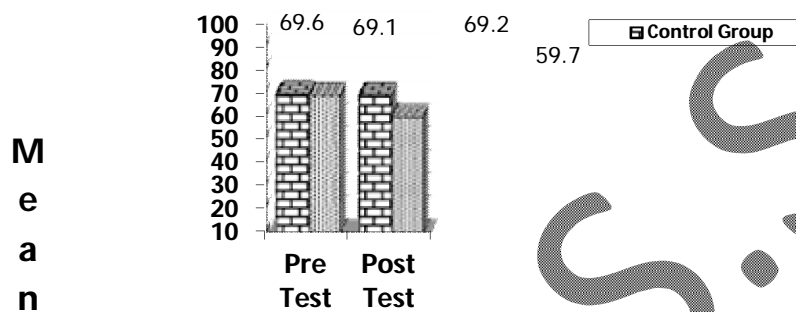


Table No: 3

Systolic Blood pressure between pre and post-Test of Experimental group of age group of 18-25 years

Experimental Group	Mean	S.D	S.E. Comb.	M.D.	D.F.	C.T.	T.T.
Pre. Test	121	5.44	1.78	3.3	18	1.85	2.101
Post Test	117.7	1.49					

Level of Significance=0.05

Tabulated 't' $_{0.05(18)}$ =2.101

Table No: 3 reveals that there is no significant difference between means of pre and post tests of experimental group, because mean of pre test is 121 is slightly higher than mean of post test is 117.7 and there mean difference is 3.3. To check significant difference between pre and post test of experimental group the data was again analyzed by applying 't' test. Before applying 't' test, standard deviation was calculated between pre test where S.D. =5.44 and after post test S.D. = 1.49 and their combined standard error = 3.3. therefore after applying 't' test it was found that there was no significant difference between pre and post tests of experimental group because value of calculated 't' =1.85 which is less than tabulated 't' = 2.101 at 0.05 level of confidence, which shows which shows that there is no significant effect on experimental group after aerobic training of six weeks.

Table: 4
Systolic Blood pressure between pre and post-Test of Control group of age group of 18-25 years

Control Group	Mean	S.D	S.E. Comb.	M.D.	D.F.	C.T.	T.T.
Pre. Test	119.4	3.18	3.94	0.4	18	0.11	2.101
Post Test	119.8	3.19					

Level of Significance=0.05
 Tabulated 't' $_{0.05(18)}$ =2.101

Table No: 4 reveals that there is no significant difference between means of pre and post tests of control group, because mean of pre test is 119.4 is slightly higher than mean of post test is 119.8 and there mean difference is 0.4. To check significant difference between pre and post test of control group the data was again analyzed by applying 't' test. Before applying 't' test, standard deviation was calculated between pre test where S.D. =3.18 and after post test S.D. = 3.19 and their combined standard error = 3.94. therefore after applying 't' test it was found that there was no significant difference between pre and post tests of control group because value of calculated 't' = 0.11 which is less than tabulated 't' = 2.101 at 0.05 level of confidence, which shows that there is no improvement in control group before and after test because no training was given to the subjects of control group.

Graph-2

Graphical Representation of Mean Difference between Pre and Post Test of Control group and Experimental Group for Systolic blood Pressure

Scale: Y-Axis: 1cm = 20 Mean

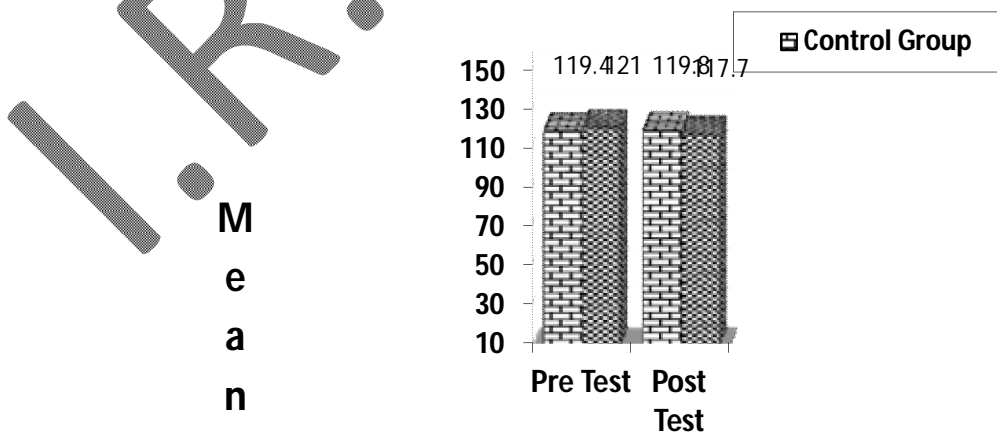


Table No: 5

Diastolic Blood pressure between pre and post-Test of Experimental group of age group of 18-25 years

Experimental Group	Mean	S.D	S.E. Comb.	M.D.	D.F.	C.T.	T.T.
Pre. Test	83.1	4.54	1.49	4.3	18	0.88	2.101
Post Test	78.8	1.32					

Level of Significance=0.05

Tabulated 't' $_{0.05(18)}$ =2.101

Table No.:5 reveals that there is no significant difference between means of pre and post tests of experimental group, because mean of pre test is 83.1 is slightly higher than mean of post test is 78.8 and there mean difference is 4.3. To check significant difference between pre and post test of experimental group the data was again analyzed by applying 't' test. Before applying 't' test, standard deviation was calculated between pre test where S.D. =4.54 and after post test S.D. = 1.32 and their combined standard error = 1.49. therefore after applying 't' test it was found that there was no significant difference between pre and post tests of experimental group because value of calculated 't' = 0.88 which is less than tabulated 't' = 2.101 at 0.05 level of confidence, which shows that there is no significant effect on experimental group after aerobic training of six weeks.

Table: 6

Diastolic Blood pressure between pre and post-Test of control group of age group of 18-25 years

Control Group	Mean	S.D	S.E. Comb.	M.D.	D.F.	C.T.	T.T.
Pre. Test	79	12.54	16.90	1	18	0.05	2.101
Post Test	78	12.75					

Level of Significance=0.05

Tabulated 't' $_{0.05(18)}$ =2.101

Table No: 6 reveals that there is no significant difference between means of pre and post tests of control group, because mean of pre test is 79 is slightly higher than mean of post test is 78 and there mean difference is 1. To check significant difference between pre and post test of control group the data was again analyzed by applying 't' test. Before applying 't' test, standard deviation was calculated between pre test where S.D. =12.54 and after post test S.D. = 12.75 and their combined standard error = 16.90.

Graph-3

Graphical Representation of Mean Difference between Pre and Post Test of Control and Experimental Group for Systolic Blood Pressure

Scale: Y-Axis: 1cm = 10 Mean

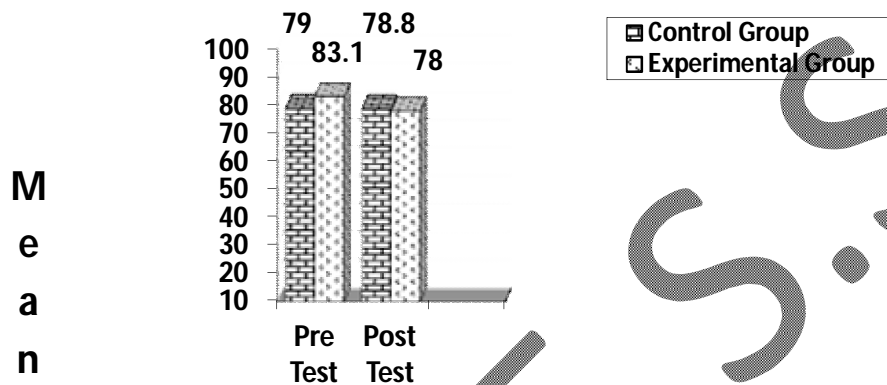


Table No: 7

Vital Capacity between pre and post-Test of control group of age group of 18-25 years

Control Group	Mean	S.D	S.E. Comb.	M.D.	D.F.	O.T.	T.T.
Pre. Test	404	56.22	24.99	8	18	0.32	2.101
Post Test	412	55.53					

Level of Significance=0.05

Tabulated 't'_{0.05(18)}=2.101

Table No: 7 reveals that there is no significant difference between means of pre and post tests of control group, because mean of pre test is 404 is slightly higher than mean of post test is 412 and there mean difference is 8. To check significant difference between pre and post test of control group the data was again analyzed by applying 't' test. Before applying 't' test, standard deviation was calculated between pre test where S.D. = 56.22 and after post test S.D. = 55.53 and their combined standard error = 24.99. therefore after applying 't' test it was found that there was no significant difference between pre and post tests of control group because value of calculated 't' = 0.32 which is less than tabulated 't' = 2.101 at 0.05 level of confidence, which shows that there is no improvement in control group before and after test because no training was given to the subjects of control group.

Table No: 8
Vital Capacity between pre and post-Test of Experimental group of age group of 18-25 years

Experimental Group	Mean	S.D	S.E. Comb.	M.D.	D.F.	O.T.	T.T.
Pre. Test	414	47.88	24.24	87	18	3.589	2.101
Post Test	501	59.89					

Level of Significance=0.05

Tabulated 't'_{0.05(18)}=2.101

Table No: 8 reveals that there is a significant difference between means of pre and post tests of experimental group, because mean of pre test is 414 is higher than mean of post test 501 and there mean difference is 87. To check significant difference between pre and post test of experimental group the data was again analyzed by applying 't' test. Before applying 't' test, standard deviation was calculated between pre test where S.D. =47.88 and after post test S.D. = 59.89 and their combined standard error = 24.24. therefore after applying 't' test it was found that there was a significant difference between pre and post tests of experimental group because value of calculated 't' = 3.589 which is higher than tabulated 't' = 2.101 at 0.05 level of confidence, which shows that there is good improvement in experimental group after six weeks aerobic training .

Graph-4

Graphical Representation of Mean Difference between Pre and Post Test of Experimental Group for Vital Capacity

Scale: Y-Axis: 1cm = 10 Mean

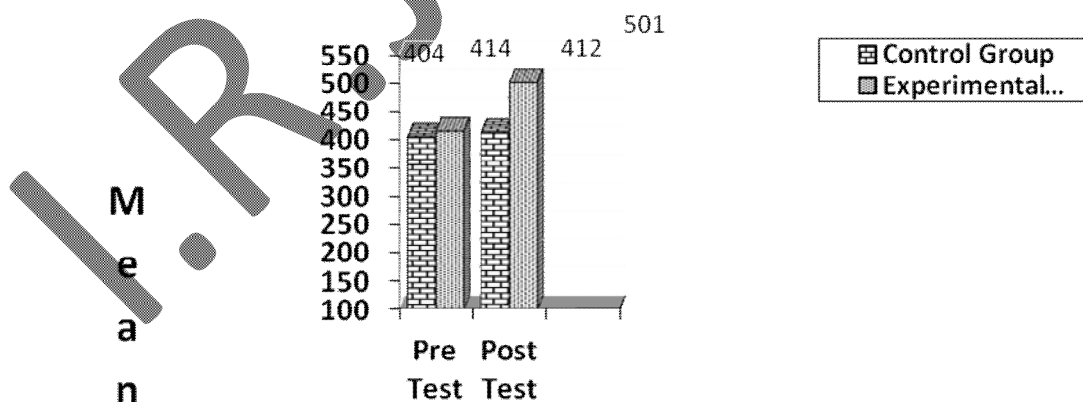


Table No: 9

Body Mass Index between pre and post-Test of control group of age group of 18-25 years

Control Group	Mean	S.D	S.E. Comb.	M.D.	D.F.	O.T.	T.T.
Pre. Test	21.46	2.05	0.84	0.04	18	0.047	2.101
Post Test	21.48	2.05					

Level of Significance=0.05

Tabulated $t'_{0.05(18)}=2.101$

Table No: 9 reveals that there is no significant difference between means of pre and post tests of control group, because mean of pre test is 21.46 is slightly higher than mean of post test is 21.48 and there mean difference is 8. To check significant difference between pre and post test of control group the data was again analyzed by applying 't' test. Before applying 't' test, standard deviation was calculated between pre test where S.D. = 2.05 and after post test S.D. = 2.05 and their combined standard error = 0.84. therefore after applying 't' test it was found that there was no significant difference between pre and post tests of control group because value of calculated $t' = 0.047$ which is less than tabulated $t' = 2.101$ at 0.05 level of confidence, which shows that there is no improvement in control group before and after test because no training was given to the subjects of control group.

Table No: 10

Body Mass Index between pre and post-Test of Experimental group of age group of 18-25 years

Experimental Group	Mean	S.D	S.E. Comb.	M.D.	D.F.	O.T.	T.T.
Pre. Test	21.35	3.84	1.78	0.43	18	0.24	2.101
Post Test	20.92	4.15					

Level of Significance=0.05

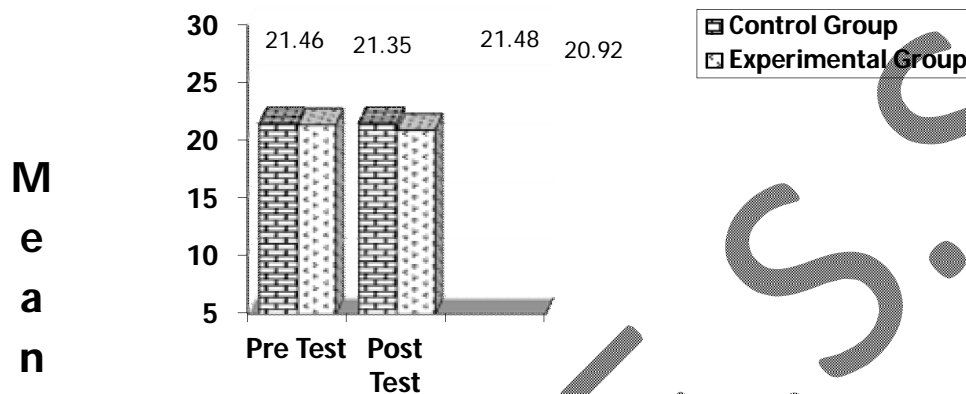
Tabulated $t'_{0.05(18)}=2.101$

Table No: 10 reveals that there is a no significant difference between means of pre and post tests of experimental group, because mean of pre test is 21.35 is higher than mean of post test 20.92 and there mean difference is 0.43. To check significant difference between pre and post test of experimental group the data was again analyzed by applying 't' test. Before applying 't' test, standard deviation was calculated between pre test where S.D. =3.84 and after post test S.D. = 4.15 and their combined standard error = 1.78. therefore after applying 't' test it was found that there was no significant difference between pre and post tests of experimental group because value of calculated $t' = 0.24$ which is lower than tabulated $t' = 2.101$ at 0.05 level of confidence, which shows that there was no significant effect on experimental group after six weeks aerobic training.

Graph-5

Graphical Representation of Mean Difference between Pre and Post Tests of Control and Experimental Group for Body Mass Index

Scale: Y-Axis: 1cm = 5 Mean



Conclusion:

After 6-weeks training the results were statistically analyzed and the following conclusion was drawn.

The study revealed that Aerobic training have a considerable effect on physiological variables however, there were significant effects on Resting Heart Rate and Vital Capacity, Blood Pressure (systolic and diastolic) and Body Mass Index did not showed significant effect after 6-weeks aerobic training program.

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